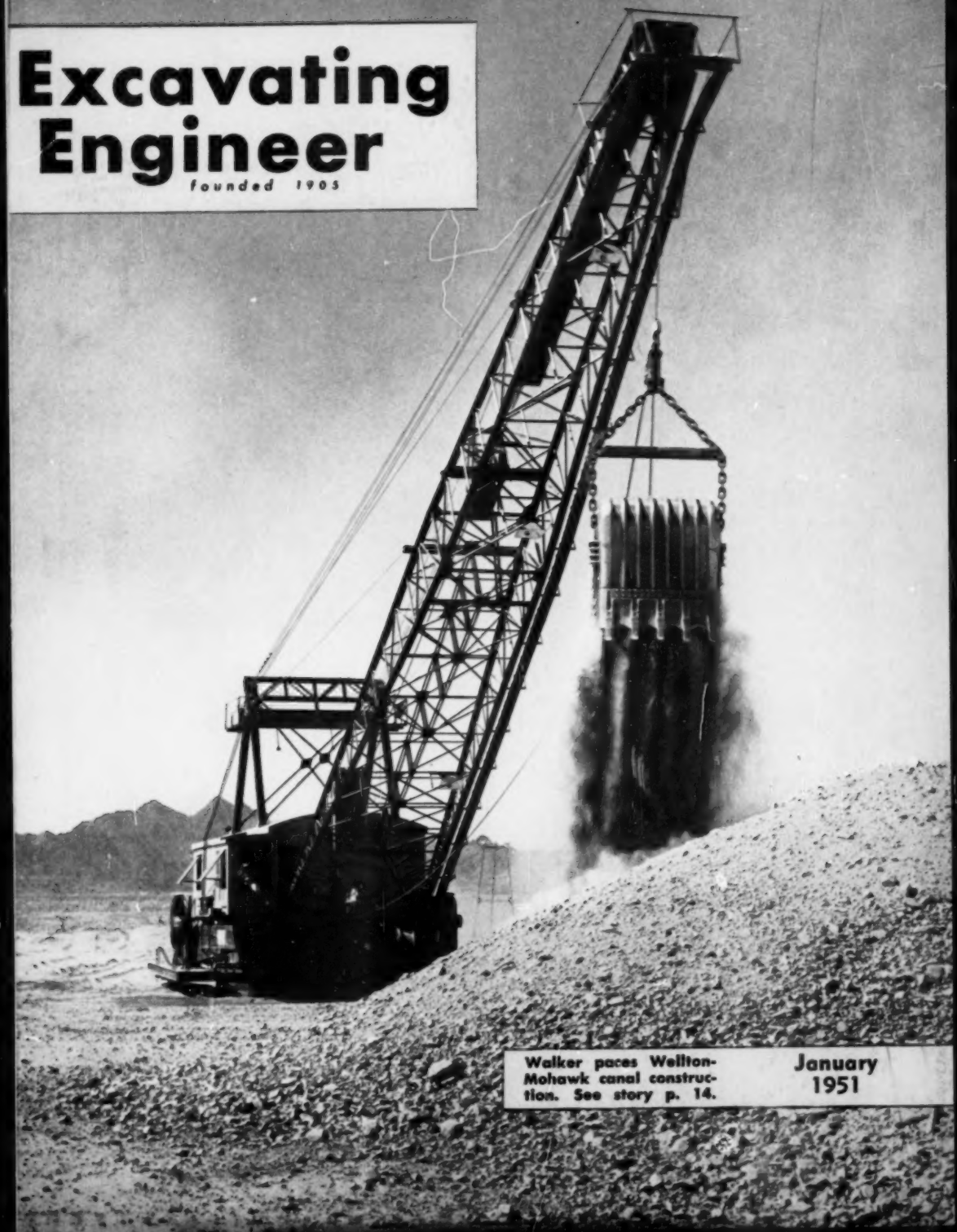
# Excavating Engineer

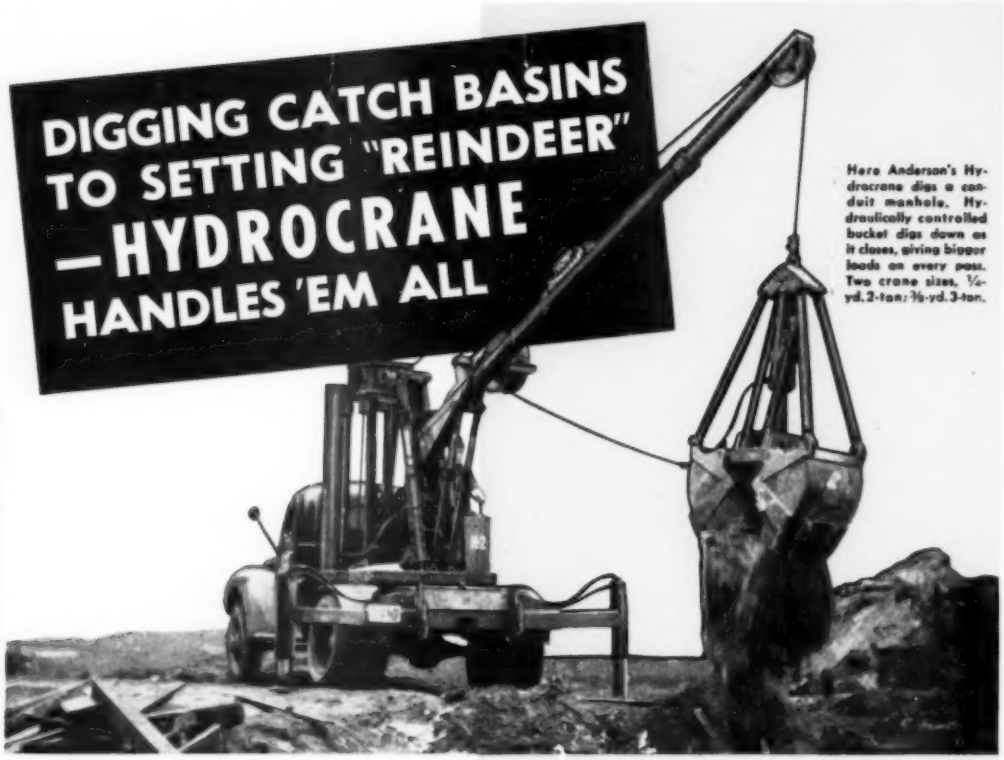
founded 1905



Walker paces Welton-Mohawk canal construction. See story p. 14.

January 1951

# DIGGING CATCH BASINS TO SETTING "REINDEER" —HYDROCRANE HANDLES 'EM ALL



Here Anderson's Hydrocrane digs a conduit manhole. Hydraulically controlled bucket digs down as it closes, giving bigger loads on every pass. Two crane sizes, ½-yd. 2-ton; ⅜-yd. 3-ton.

Although the Robert R. Anderson Co., Chicago, Ill., bought their Bucyrus-Erie Hydrocrane to dig catch basins, this smooth-working hydraulic rig has paid off on dozens of jobs — even to setting a life-sized reindeer and giant Christmas wreath in a city park.

On one 180-unit catch basin job, the crane dug an average of four 125-cu. ft. basins per day, including connections. The crane's telescoping boom and ability to work in close quarters kept the job moving fast.

### SURPRISE ON PILE DRIVING

While working on a man hole excavation, this contractor had to drive sheet piling to prevent cave-ins. As an experiment, he attached an 1800-lb. hammer to the Hydrocrane and found it worked excellently on pile driving. This saved renting a friction crane and showed the company a new source of income.

BUCYRUS ERIE HYDROCRANE

**SOUTH MILWAUKEE, WISCONSIN**

The firm's Hydrocrane also handles complete septic tank jobs — digging, tank setting, backfilling. Other jobs include digging foundations, setting factory machinery and pre-cast pipe, erecting wooden roof trusses and I-beams, and loading pumps and compressors.

Here is a rig that will make money on dozens of jobs you're now passing up — or doing with expensive hand labor.

**Get full details. Send the coupon now.**

**BUCYRUS-ERIE HYDROCRANE DIVISION**
**SOUTH MILWAUKEE, WISCONSIN**

I want to know more about the profit-making Hydrocrane:

Name .....

Company or Dept. .....

Address .....

City ..... State .....

92HS1C

# BRANDS *are important!*

Cattle are branded primarily to prove ownership.
But, experienced cattlemen and livestock buyers know that
some brands are always found on higher quality animals.
These brands come from better feed and water,
from better breeding stock, from better handling.
The HAZARD brand on a reel of wire rope is your assurance of quality—
quality backed by wire rope manufacturing experience
dating back to 1848. Next time specify HAZARD.
Remember— *"Brands are important!"*

ACCO *In Business for Your Safety*

AMERICAN CHAIN & CABLE
HAZARD WIRE ROPE DIVISION

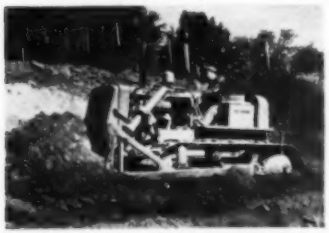
Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

# OUT AHEAD

## with GM DIESEL POWER!

**HD-20**—41,800 lbs. of properly balanced weight; long, wide sure-gripping tracks and the new GM 6-110 Diesel engine driving through hydraulic torque converter give the Allis-Chalmers HD-20 brute strength to take toughest jobs in stride.

**HD-15**—27,500 lbs.—102 Drawbar H.P.—powered by a 6-cylinder GM Series 71 Diesel engine.



**HD-9**—18,500 lbs.—70 Drawbar H.P.—powered by a 4-cylinder GM Series 71 Diesel engine.

General Motors 2-cycle Diesel engines supply the hard-hitting power that enables Allis-Chalmers' great new line of tractors to outwork all others.

Four and six-cylinder GM Series 71 engines driving the HD-9 and HD-15—and the powerful new GM 6-110 engine driving the HD-20—give these new tractors a reserve of smooth, dependable power for easy handling, increased work and minimum maintenance.

The greater efficiency of 2-cycle operation and direct fuel injection simplifies design and enables these engines to produce far more horsepower than other Diesels of equal size and weight. Interchangeability of Series 71 engine parts provides maximum availability—keeps them on the job.

That's why GM Diesel engines are chosen to power not only the "World's most modern line of crawler tractors"—but more than 500 different kinds of machinery built by 120 manufacturers.

**DETROIT DIESEL ENGINE DIVISION**

SINGLE ENGINES... Up to 275 H.P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS... Up to 800 H.P.

GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK

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# Excavating Engineer


*founded 1905*


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Regular Subscription (payable in advance): 35 cents per copy, $3.50 a year; Canada and foreign, subject to publication policy, $5.00 per year. Special subscription: Upon written request on company letterhead this publication will be sent free of charge to companies, executives and supervisors engaged actively in excavating. Occupation of subscriber must be given for all subscriptions, paid or special. Right is reserved to refuse foreign subscription. Indexed by Engineering Index, Inc.

Published Monthly by

THE EXCAVATING ENGINEER PUBLISHING COMPANY

South Milwaukee, Wisconsin, U. S. A.

E. M. HEUSTON, Publisher
W. C. VAN DYKE, Editor
M. B. JAEGER, Managing Editor
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# New tractor packs more punch for its size–with help of 54 TIMKEN® bearings!

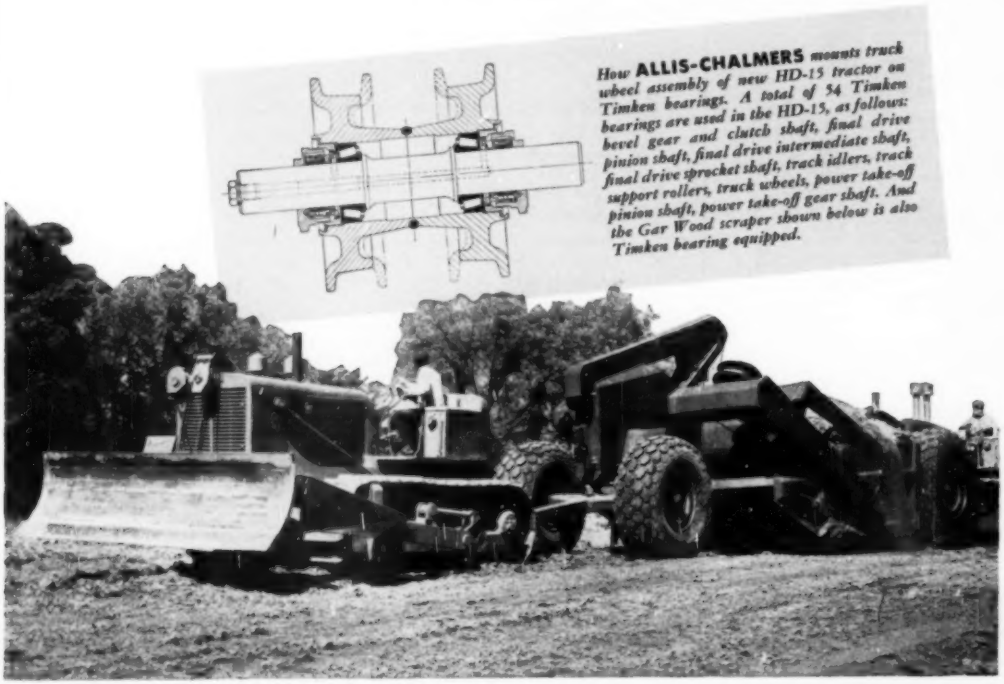
BIG news for tractor users is this Allis-Chalmers HD-15 tractor, shown below loading a Gar Wood scraper. New from the ground up, it provides more weight and power than previously considered standard for its class.

To insure smooth, dependable operation with minimum maintenance, under the toughest loads, Allis-Chalmers mounts vital parts of the HD-15 on Timken® tapered roller bearings. A total of 54 Timken bearings are used.

Timken bearings prevent wear on moving parts by holding gears and shafts in proper alignment. They take both radial and thrust loads in any combination, eliminating the need for special thrust bearings and making possible a more simplified, rugged design. Because of the line contact between Timken bearing rollers and races, Timken bearings provide extra load capacity—carry the heaviest loads safely. And Timken bearings permit the use of tighter closures which retain lubricant, keep dirt out.

The rolls and races of Timken bearings are made of Timken fine alloy steel, case-hardened to give a hard, wear-resistant surface and a tough, shock-resistant inner core. Normally, Timken bearings last the life of the machine in which they are used. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

*This symbol on a product means its bearings are the best.*



*How* **ALLIS-CHALMERS** *mounts truck wheel assembly of new HD-15 tractor on Timken bearings. A total of 54 Timken bearings are used in the HD-15, as follows: bevel gear and clutch shaft, final drive pinion shaft, final drive intermediate shaft, final drive sprocket shaft, track idlers, track support rollers, truck wheels, power take-off pinion shaft, power take-off gear shaft. And the Gar Wood scraper shown below is also Timken bearing equipped.*

**NEW ENGINEERING JOURNAL OFFERED!**

**529 PAGES!** Includes new, technical information on bearing applications available nowhere else. Especially helpful to design engineers. Gives bearing dimensions, capacities, selection and mounting data. For a copy, write on your company letterhead to The Timken Roller Bearing Company, Canton 6, Ohio.

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***TAPERED ROLLER BEARINGS***

NOT JUST A BALL ◯ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ▯ AND THRUST ◫ LOADS OR ANY COMBINATION ◉

# Do it the NORTHWEST way—

## ....with a NORTHWEST—for the HEART of the job!

HERE'S a spot where the profits begin—The Batcher Plant! Put the batcher plant "down" because of crane failure and it costs you money out on the grade.

Your Northwest gives you the smooth, steady operation hour after hour that keeps the trucks rolling.

The "Feather-Touch" Clutch Control is free from tubing, pumps and complications. There can be no shutdown because of control failure. Uniform Pressure Swing Clutches take the jerks and grabs out of swinging, reduce adjustment and save time in spotting the load.

Cast steel machinery bases and machinery side-frames keep shafts in alignment and reduce wear, and many other Northwest features keep the dollars swinging. You can't afford anything but the best for the heart of your job. Plan now to have a Northwest in the Key Spots on your job. Let us tell you how.

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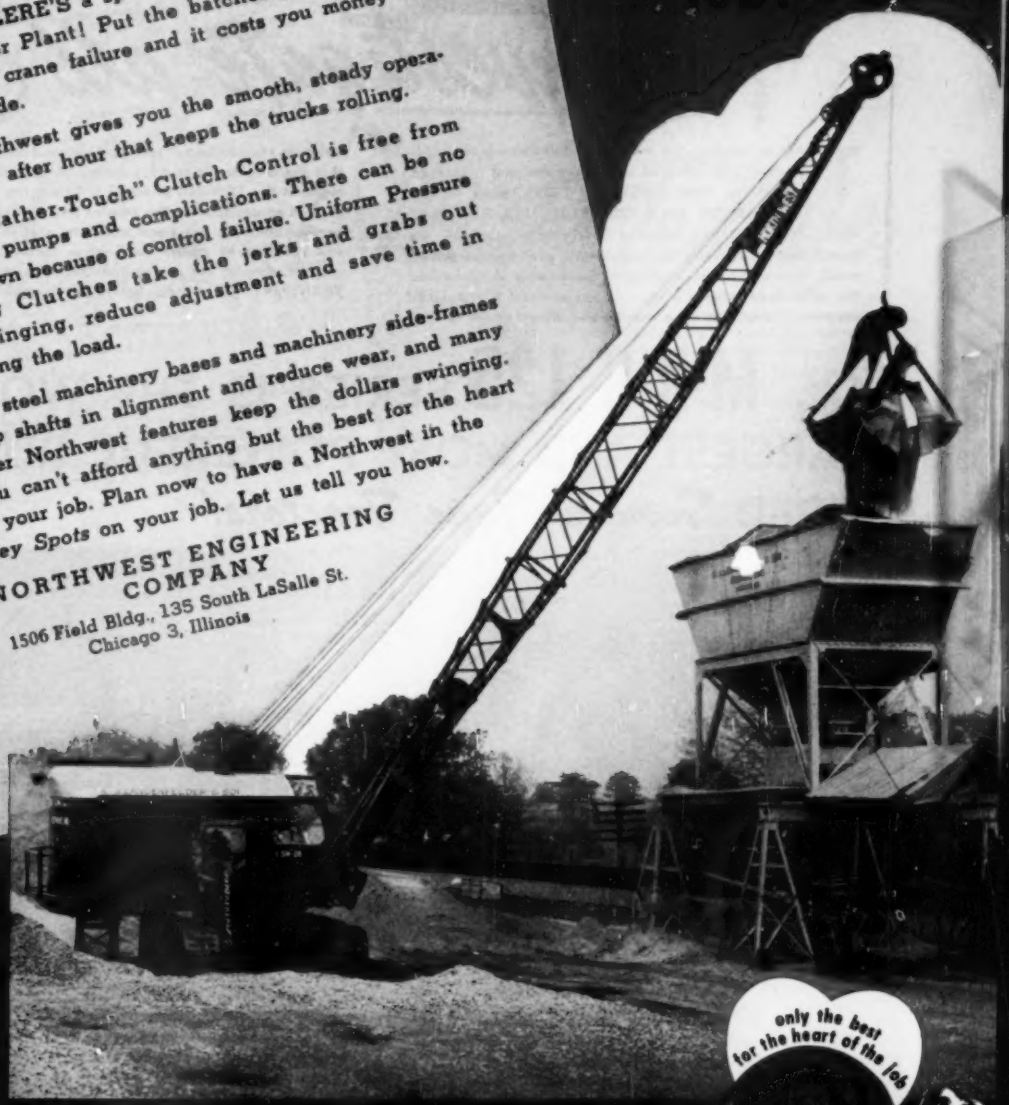


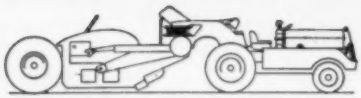
only the best for the heart of the job

# NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

THERE ARE ONLY THREE TYPES OF HEAVY RUBBER-TIRED SCRAPER EQUIPMENT

1.



THE SEMI-TRAILER

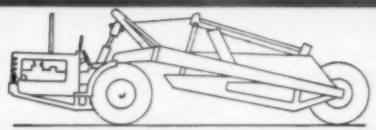
# Investigate all 3

There is one sure-fire method of determining the superiority of any piece of equipment and that is through competitive tests. ACTUAL TESTS made, where PAYLOADS OF EACH COMPETING SCRAPER UNIT WERE WEIGHED and impartial time studies obtained, the M-R-S tractor, powering the contractor's own, large, standard make, four-wheel, cable scrapers, consistently out-produced the specialized scraper units. Copies of these performance reports are available upon request and should prove conclusively to the contractor seeking high production at low cost, that the only really sound principle of operation in a prime mover is the TOWING principle. This is the same principle used so successfully in the crawler type tractor-large scraper combination. It has been modernly applied to the speed and economy of rubber tired prime movers in the M-R-S tractors, through the patented, exclusive feature of WEIGHT TRANSFER! Investigate, before you invest!

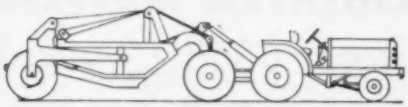
## *The* M-R-S 125 SERIES IS THE WORLD'S LARGEST AND MOST POWERFUL RUBBER-TIRED *Towing-Type Tractors!*

M-R-S MANUFACTURING

Represented in Foreign Trade

2. 

THE TWO-AXLE UNIT

3. 

THE TOWING-TYPE TRACTOR

# CHECK THESE Facts!

**SHORT TURNS**
Even with the larger capacity scrapers, the M-R-S tractor-scraper combination turns easily within 28 to 34 feet and Weight Transfer is available to give added traction on the soft fills when needed.

**LONGER TRACTOR LIFE**
There is no burden of the trailer and payload on the M-R-S tractor at high speeds, keeping the tractor free of the harmful pounding and surging over rough haul roads.

**OPERATOR COMFORT**
Each M-R-S tractor is equipped with an automobile type drivers seat, adjustable to the height of the driver. As a towing-type tractor, the operator is free from load shock and can maintain maximum, safe speeds at all times.

**HIGHER PRODUCTION**
Since the M-R-S tractor merely TOWS its load, larger capacity scrapers may be used and at greatly increased speeds on every trip.

**LESS INVENTORY**
As a towing-type tractor, the contractor's presently owned scraper, compacting rollers, and other allied equipment may be used. This is versatility unparalleled by specialized tractor power.

# Only M-R-S TRACTORS HAVE Weight Transfer

When the two earlier type scraper units were designed (the semi-trailer and the two-axle unit), the necessity of weight on the tractor drive axle for traction was recognized as being MANDATORY. To obtain this weight, the scraper in both instances was designed with only a rear axle while the tractor carried a portion of the load on the drive wheels. In both instances, the capacity of the scraper was limited to the amount of tractive ability available and the ability of the prime mover to CARRY the load at high speed.

Weight Transfer, an exclusive M-R-S feature, produces the necessary weight for traction when needed but does not burden the prime mover with the constant load at high speeds. It permits the "switch" of the contractors presently owned scraper from crawler to rubber tired power. It makes possible, speed, power, versatility and low equipment inventories not possible by any other principle of operation. It is proof positive, again, that

*Man, Beast or Prime Mover can* **TOW LARGER LOADS** *Faster than can be carried*

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Please send me additional information and performance reports on the M-R-S 125 series of Tractors.

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By International Harvester Export Company, Chicago, Illinois

# SOUTHERN MATERIALS COMPANY ALMOST DOUBLES WIRE ROPE SERVICE LIFE WITH J&L CENTERFIT

**J&L STEEL**

ABOVE: This Dravo C-14 whirler crane with a clamshell bucket moves hundreds of tons of sand and gravel daily. Holding and closing lines are J & L CenterFit wire rope.

LEFT: CenterFit closing line on this multiple reeved clamshell lasted an average of more than five weeks longer than competing ropes in this application.

## J&L CenterFit Holding and Closing Lines Outlast Nearest Competitor by an Average of More Than 5 Weeks

Here's a report on the service life of J & L CenterFit Wire Rope from the Southern Materials Company, Richmond, Va., large producers and handlers of Sand, Gravel, Ready Mixed Concrete, SOLITE and Slag.

Southern Materials used a Dravo C-14 whirler crane with a 2 cu. yard clamshell bucket to test four competing brands of wire rope, among them J & L CenterFit wire rope.

**Among the ten ropes tested J & L CenterFit holding and closing lines had an average service life of nearly twice that of the competing brands.**

This is how the ten ropes compared:

| Brand | Service Life |
|---|---|
| A | 5 weeks 3 days<br>5 weeks 1 day<br>5 weeks 1 day |
| B | 5 weeks 3 days<br>5 weeks 6 days |
| C | 7 weeks<br>4 weeks 6 days |
| J&L CENTERFIT | 10 WEEKS 2 DAYS<br>14 WEEKS<br>10 WEEKS |

It's no wonder that equipment owners are turning to CenterFit—the new wire rope produced exclusively by J&L for use on equipment having small sheaves and drums.

Unlike conventional wire ropes CenterFit is laid together in one operation. All strands run in the same direction with outside strands fitting snugly into the valleys between inside strands. This unique construction means more steel and fewer voids than any conventional wire rope. The result: Higher Strength . . . Greater Flexibility . . . Easier Handling . . . Longer Service Life.

Get the facts on this new wire rope design. Write Jones & Laughlin Steel Corporation, 429 Jones and Laughlin Bldg., Pittsburgh 30, Pa., for our free booklet, "CenterFit".

## JONES & LAUGHLIN STEEL CORPORATION

*From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in* OTISCOLOY *and* JALLOY *(hi-tensile steels).*

**PRINCIPAL PRODUCTS:** HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

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**New principle for backhoes provides**

# UNBELIEVABLE DIGGING POWER

***It's in the New Sherman Power Digger!***

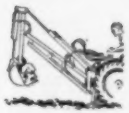
- Patented, actuated bucket gives you selective digging action, better loading, greater versatility.
- All-hydraulic action—made possible by heavy-duty hydraulic cylinders—assures efficient performance.

**Specifications**

| | |
|---|---|
| Shovel reach below ground surface | 8 feet |
| Digger reach behind tractor | 10 feet |
| Swinging arc | 140° |
| Trench width, standard digging shovel, single cut | 18 inches |
| Digging shovel capacity | 3.5 cu. feet |
| Loading shovel capacity | .5 cu. feet |
| Loading clearance, digging shovel, loaded | 7 feet |
| Loading clearance, loading shovel | 10 feet |

- *Standard tractor mounting gives unmatched maneuverability and transportability.*

- *Digs ditches, trenches, footings, culverts, basements and other excavations.*



- *Handles roots, rocks, hard clay and oiled road surfaces.*

- *Works well behind the tractor at any angle.*

- *Actuated bucket raises high enough to load standard dump truck.*

Find out about this addition to the Sherman line of digging equipment. It is an economical answer to your digging problems. Write for literature today!

SHERMAN

## POWER DIGGER

MODEL 54B100

Designed, Engineered and Manufactured Jointly By:
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# get more E.P. per dollar!

XR50-8

Explosive Power is what you pay for when you buy explosives. You get more E.P. for your dynamite dollar with Hercules Hercomites® and Gelamites® because these explosives not only give better breakage than older-type explosives, but are more economical to use than extra dynamites and gelatins. And there's a series for practically every mining, quarrying, and construction need.

"Hercomites," for example, come in fast, intermediate and slow heaving-action types. One series is especially designed for poorly ventilated places. All offer improved water resistance and, like "Gelamites," come in handy Tamptite® cartridges. For full information, write for illustrated booklet, "Hercomites and Gelamites for Lower Blasting Costs."

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*972 King Street, Wilmington, Delaware*

4-wheel drive 1½-yd. Model HM PAYLOADER on New Jersey Turnpike, George M. Brewster & Son, Inc., contractor.

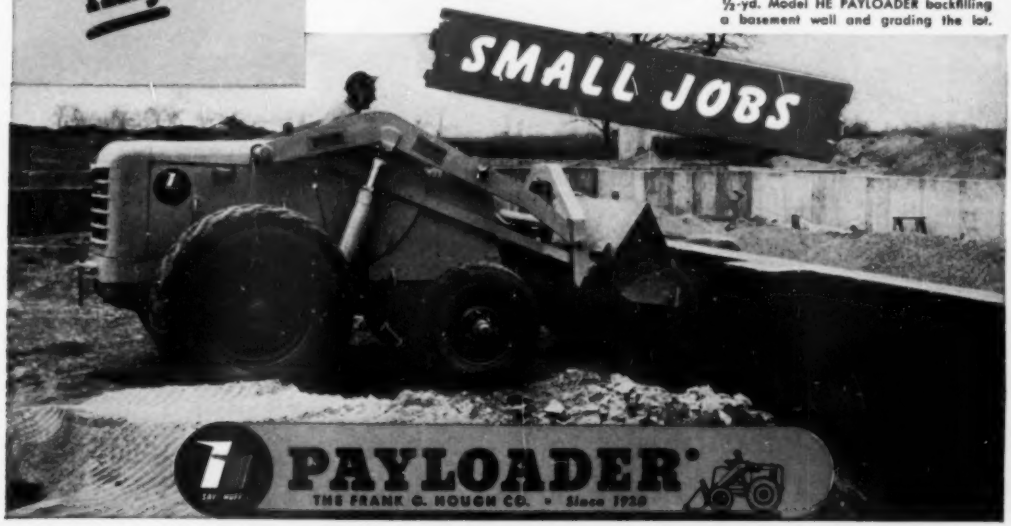
# PAYLOADERS Pay Off on Any Job

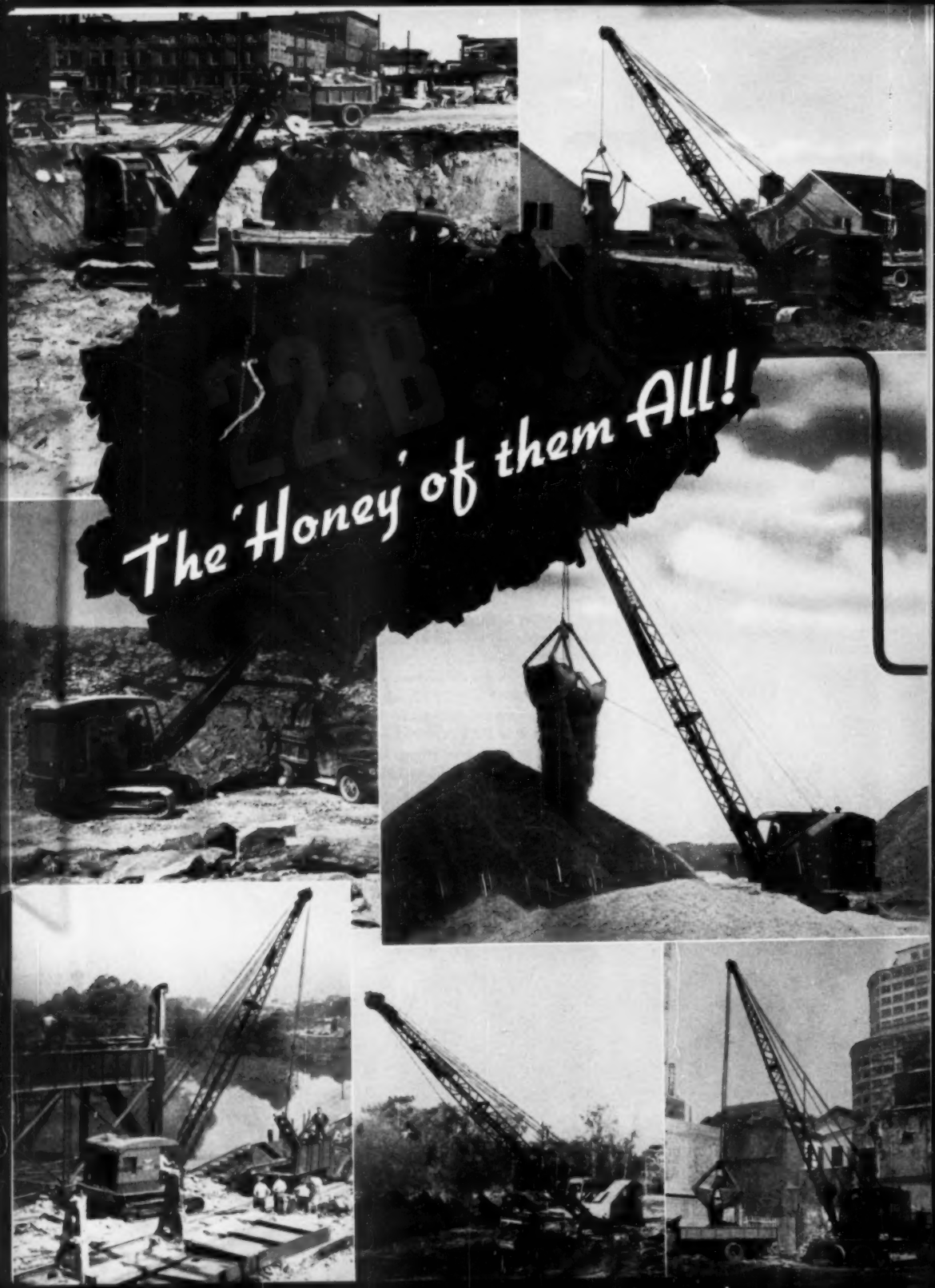
Big or small — tough or easy — any job is a Payloader job . . . because only a PAYLOADER is completely designed for its purpose.

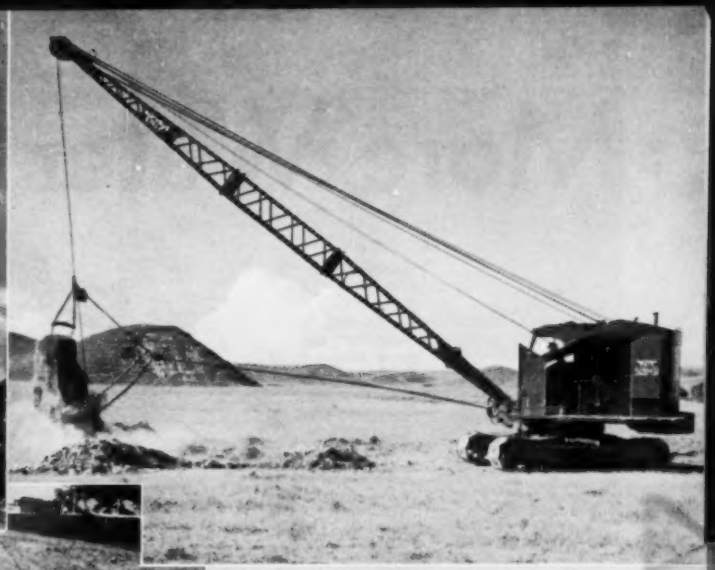
Only the PAYLOADER gives you the high multiple forward and reverse speeds . . . the engine over wheels for maximum traction . . . the powerful shovel crowding action . . . the simplicity of design for maintenance economy . . . the tip-back bucket to assure full loads . . . the dependability of large heavy duty clutches…the rugged overall construction and complete operator comfort and visibility which means more working hours per shift.

That's why many of America's progressive contractors, large and small, own fleets of PAYLOADERS; why Public Bodies rely on PAYLOADERS; why you too should investigate these high speed, rugged tractor-shovels. There's a size of PAYLOADER to fit your job; 12 cu. ft.; ½-yd.; ¾-yd.; 1¼-yd.; 1½-yd. See your Hough Distributor or write The Frank G. Hough Co., 708 Sunnyside Avenue, Libertyville, Illinois.

½-yd. Model HE PAYLOADER backfilling a basement wall and grading the lot.




The 'Honey' of them All!



Ask owners – they'll tell you that no other ¾-yd. excavator can match 22-B speed, control, durability, or OUTPUT in all types of digging.

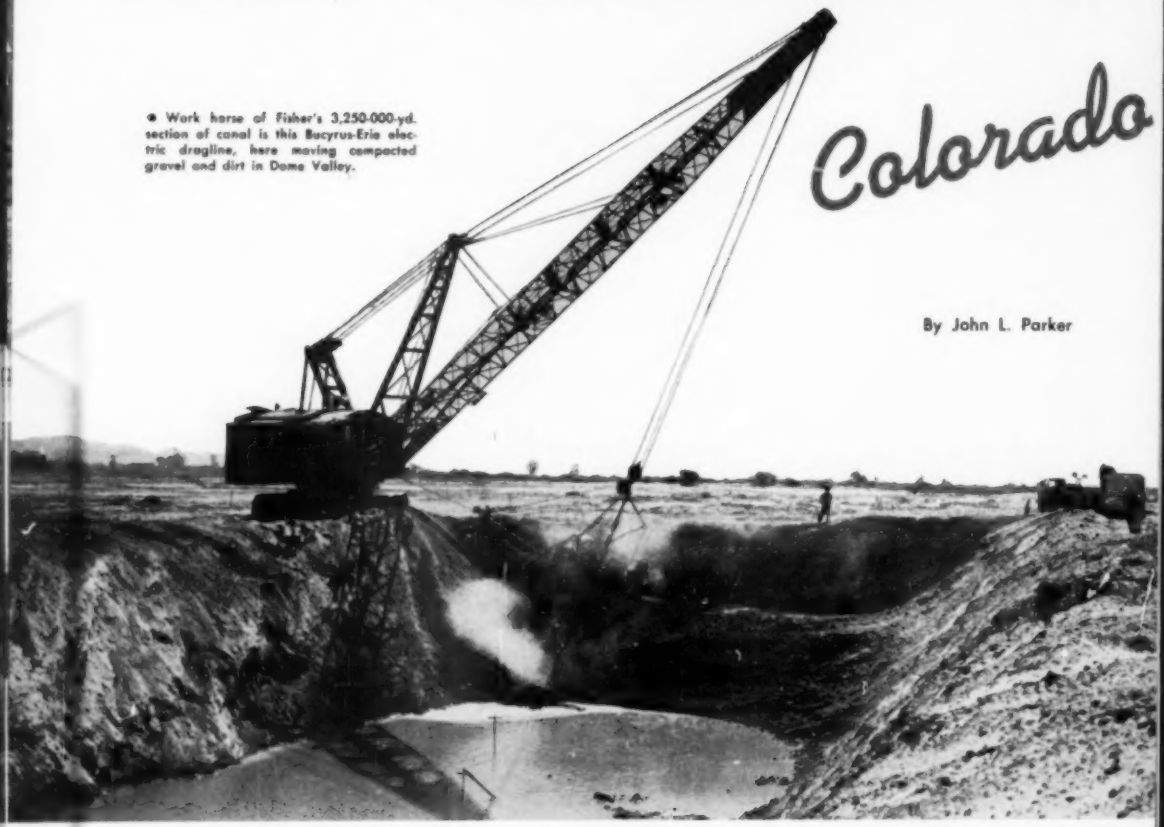
**Bucyrus-Erie Co.**
South Milwaukee, Wis.

202ESIC

SEE YOUR BUCYRUS-ERIE DISTRIBUTOR
for full information on Bucyrus-Erie gas, diesel and single motor electric ⅜ to 4 yard excavators

BUCYRUS ERIE

# More Water from the Colorado



• Work horse of Fisher's 3,250,000-yd. section of canal is this Bucyrus-Erie electric dragline, here moving compacted gravel and dirt in Dome Valley.

By John L. Parker

ARIZONA'S newest irrigation project will soon be putting the bloom on 75,000 acres of desert in the southwest corner of the state near the border town of Yuma on the Colorado River. This will include thousands of acres of Gila Valley land presently being irrigated by pumping from wells that are becoming salty and must soon be abandoned.

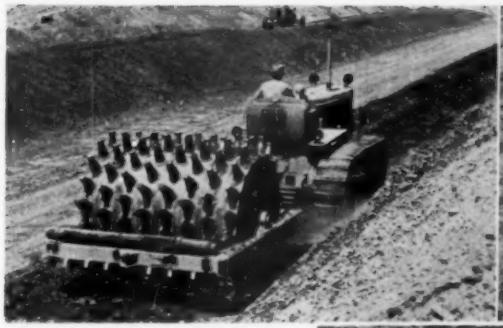
Water to irrigate the old and new farms will come from the Imperial Dam on the Colorado, 18 miles above Yuma. The Imperial now supplies water for the California side and for 40,000 acres of the Yuma mesa on the Arizona side. The new project under construction takes off from the Gila Gravity Main Canal opened several years ago to supply the entire Gila project in Arizona. This is the Wellton-Mohawk division which begins 15 miles east of Yuma at a point where the main canal siphons under the Gila River. It runs for several miles through Dome Valley along the main line of the Southern Pacific railroad before turning east to extend nearly 50 miles into the Wellton and Mohawk areas in the form of two main canals, the Wellton and the Mohawk, plus a small lateral ditch.

### Ready by 1952

The first 18½ miles of the combined Wellton-Mohawk Canal is under construction and will be ready to carry water in 1952. The big ditch is being dug by two contractors under Bureau of Reclamation supervision. The Fisher Contracting Co., Phoenix, Ariz., has the first 8½ miles of the construction involving 3,250,000 yards of excavation. The United Concrete Pipe Co. of Los Angeles is installing three big pumping plants to lift the flow a total of 170 feet. The third section of the project is nearly ten miles of concrete-lined canal being handled by Morrison-Knudsen Company, Inc. of Boise, Idaho.

The Fisher operation takes the new canal from its Gila main canal connection. It is a contract for $1,381,000 to build a clay-lined trapazoidal-shaped canal with a bottom width of 44 feet to carry water at a depth of 8.76 feet. Capacity of this gravity flow portion of the canal is 1,300 second feet to feed the entire 75,000 acres of irrigation.

Fisher has the job 80% completed. To do the main work of digging out the compacted gravel and dirt up



• Special-built 6-ft. 10-in. sheepsfoot roller made in Fisher shops assumes a minimum pack of six feet. Caterpillar D6 grader spreads lining material to 10-in. thickness and tamper makes 10 passes on each lift.

• Upper right: Single shank 36-in. ripper drawn by Allis-Chalmers HD-19 tractor breaks up bench on a small hill to supply clay for the canal lining.

• Right: Double drive high speed Euclid 10-yd. self loading carriers speed up operations getting the clay benches open.

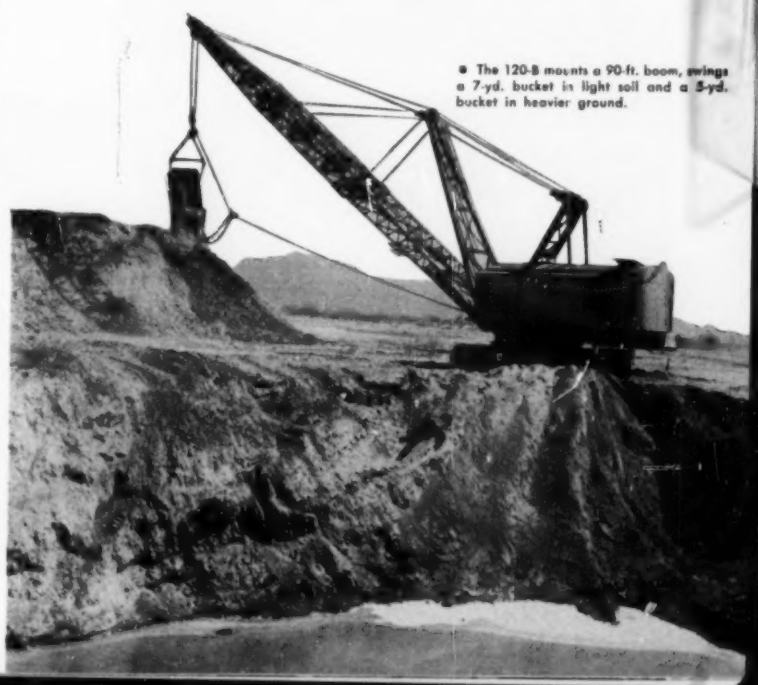
Excavating 3,500,000 yards of material to bring precious water to the Gila Valley, two contracting companies are cutting the Bureau of Reclamation's 18½-mile Wellton-Mohawk Canal through a sunburnt desert.

through Dome Valley, Fisher is using a Bucyrus-Erie 120-B electric-powered dragline with a 90-ft. boom, swinging a 7-yd. bucket in light soil and a 5-yd. bucket in the heavier ground. The excavation will average 27 feet deep and 54 feet across the bottom with a two to one slope on the sides. Electricity for the 120-B is supplied by a diesel electric generating set designed in the company shops at Phoenix.

A Koehring 84 swinging a 2-yd. lightweight bucket is used to trim the sides and keep the cut to nearly exact size. This method of handling the final trim prevents excess use of the clay lining material. Hendrix buckets are being used on both dragline operations.

### Lay 2-ft. Clay Lining

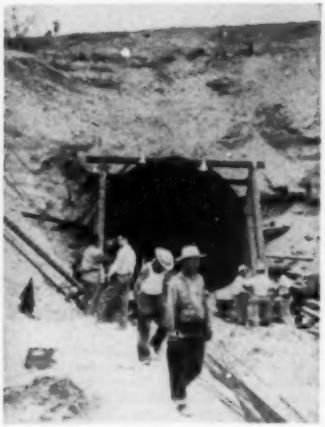
In addition to the several million yards of ground being moved by the two draglines, another 250,000 yards of the cemented gravel and decomposed rock were handled by a group of five D8 Caterpillars using rippers and scrapers to tear out the spots which could not be readily handled by the draglines. The Caterpillar equipment alternates between ditch work and pit stripping to supply the compacted clay earth fill for eight feet of horizontal lining. The bottom is lined with two



• The 120-B mounts a 90-ft. boom, swings a 7-yd. bucket in light soil and a 5-yd. bucket in heavier ground.

• Part of Fisher's concrete work consists of installing surface drains to take care of flash floods which occur frequently in the Dome Valley length of the canal.

• Raymond J. Thomas, operator of Bucyrus-Erie 200-W dragline (pictured on cover) climbs into his "office."



• The M-K contract called for an 18 x 18-ft. tunnel under the Southern Pacific railroad tracks. Footing soil was stabilized by inserting chemicals into the ground under pressures up to 1,000 psi.

feet of clay by first putting down 2 to 6-ft. layers of liner to furnish a roadbed for the hauling trucks and then laying the final foot in two 6-in. lifts during the haul.

By going back into the Gila mountains a short distance above the valley, Fisher was able to locate good deposits of clay which could be readily opened and gravity fed to the clay mixing plant.

The clay is ready to use after being screened for oversize. In the pit work only ripper and dozers are needed to feed the clay plant. An Allis-Chalmers HD-19 using a 36-in. single shank Caterpillar ripper does an excellent job of keeping three D8 bulldozers supplied with broken material for dozing to the plant. Another D8 is used for auxiliary ripping when needed.

The clay material is pushed over the bank and dropped onto a Cedar Rapids 36-in. pan feeder loading a 36-in. by 120-ft. belt conveyor dropping onto a Symons vibrating grizzly at the head of the clay storage bin. The grizzly has 4½-in. spacing to discard a small percentage of oversize. The material breaks readily and requires no blasting.

### Clay Watered at Grizzly

An interesting sidelight on the operation is the method of mixing the water with the clay for optimum moisture to gain maximum compaction at all times. Water from a well is pumped 4,000 feet under pressure and sprayed onto the clay dropping from the grizzly so that virtually perfect moisture distribution is gained before the material has landed in the bin. The average moisture requirement is 10% by weight. Through the arrangement of

*Continued on page 32*

• Swinging a ¾-yd. bucket, Link-Belt Speeder model 70 rubber-mounted crane handles largest concrete pour on the Fisher job. When finished, control gates will divert water from the Gila main gravity canal at the edge of the Gila River to the Wellton-Mohawk.

• Caterpillar D8 bulldozer uses 15-ft. wings to trim the canal to exact size. Built in M-K shops, the interchangeable blades are of 8-in. channel iron and are designed so the angle can be adjusted to slope variations.

• Upper right: Lorel Myers, Bureau of Reclamation design engineer and Clyde Shield, Bureau field engineer. Below: Jack Binder, project engineer for M-K.

• Right: Concrete work begins on the No. 1 pumping station at the beginning of the concrete lined section of the canal. At lower right are large wooden forms for intake structures.

• Below: Northwest 95 clamshell cross-piles material at batch plant. Power for plant is supplied by Chicago Pneumatic diesel engine powering a 5 KVA General Electric 60-cycle generator to operate 220 and 440-volt motors.

• One of the huge Buckeye 51 trenching machines gouges out the Super Inch trench, 48 inches wide and from 5½ to 8 feet deep. Ditchers have 32 speeds in four combinations, can dig up to 35 feet per minute.

# Span California with Super Inch

**Lay 34-in. natural gas pipeline, largest to date, 506 miles across Southern California desert and mountains at 9,000-feet-per-day clip.**

By Mark McMillin

CALIFORNIA'S Super Inch natural gas pipeline — largest diameter high-pressure line in the world — is now near completion and by this month, Northern and Central California will be receiving 150 million cubic feet of out-of-state gas per day; and by 1952, 400 million cubic feet per day.

The 34-in. diameter line (Big Inch was only 24 inches in diameter) is 506 miles long and forms a part of a 1,600-mile transmission system being built to bring gas from the San Juan Basin of New Mexico and the Permian Basin of New Mexico and Texas.

Backers of the project — estimated to cost $150 million — are the El Paso Natural Gas Co. of Texas and the Pacific Gas and Electric Co. of California. Pacific Gas has let the Super Inch portion of the line in California to Bechtel Corp., San Francisco, Calif. The big line extends from Topock, Ariz., to Milpitas, Calif., over a route passing near Barstow, Mojave, Bakersfield, and Kettleman Hills.

The El Paso concern completed 628 miles of 30-in. line from the Permian Basin this fall, and will build 433 miles of 24-in. line from the San Juan Basin by the end of 1951. Connection will be made at Topock with the Super Inch line.

Population increases in Central and Northern California since the war drained the state's natural gas reserves to the point where local wells were becoming inadequate to handle demand. A lack of new gas discoveries in California in recent years added to the problem. On the other hand, big gas discoveries in mid-continent fields, justified building the new transmission line to the West Coast.

The northern end of the Super Inch —an 80-mile stretch from Hollister to the San Francisco Bay area—was constructed first, for three reasons: (1) It was desirable to take advantage of the dry summer season in this area. (2) When the northern end was completed in November, 1949, all operations were transferred to the hot desert area at Topock taking advantage of the cooler winter months. (3) Abnormal peak loads of natural gas in the Bay region were taxing existing lines. The 80 miles of 34-in. diameter pipeline already finished were used as a loop main of the Pacific Gas and Electric Company's Bay Line, between Kettleman Hills gas fields and Milpitas, routing increased deliveries into the San Francisco area.

Excavation on the northern 80 miles was not particularly tough, as the only rock encountered was sandstone. The greatest difficulty appeared in the last 11 miles of this section when it became necessary to pass through the populated and agricultural section near Milpitas, and through the Panoche Hills.

### 9,000 Feet Per Day Across Desert

The big high pressure line—carrying up to 800 psi—was pushed across the Mojave desert at a 9,000-foot-per-day clip by one gang. The major portion of the terrain was flat desert sand, although steep and rocky passes were frequently encountered.

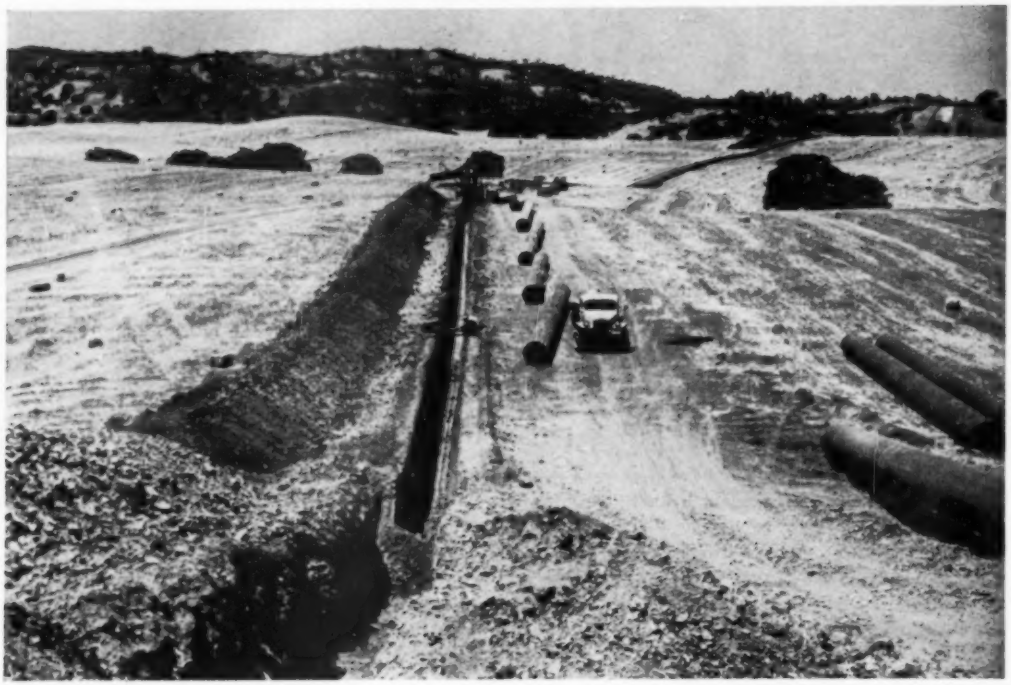
In advance of the actual excavation work, a right-of-way strip, from 50 to 75 feet wide, was cleared. In general, 54-ft. benches had to be carved out of the hillsides along this right-of-way, in order to provide working space for the ditchers and other equipment. Occasionally, the right-of-way gang cut off the tops of hills to eliminate steep grades that would have required sharp angles in the steel line.

Access roads had to be constructed to permit the movement of equipment and the transportation of pipe. Often, these roads had to be routed around canyons and gullies.

Bulldozers cleared the right-of-way

• Route of the Super Inch. The 34-in. line runs 506 miles through all kinds of terrain to form part of a 1,600-mile transmission system carrying gas to the bay area from New Mexico and Texas.

• Terrain backhoe assists the ditchers where rough going is encountered in the Panoche hills. The northern section of the line was constructed first to take advantage of the summer weather.



• Buckeye ditcher cuts across central California, where hard rocky ground made going difficult.

of trees and bushes; sandstone was broken and removed with trench hoes. Heavy rocks were blasted out.

As an indication of some of the engineering problems involved, the line crosses the Tehachapi Mountains at an elevation of 4,500 feet, and then drops within seven miles, to the San Joaquin Valley level of approximately 500 feet. Depressions of all sizes averaged one per mile, and many of the deeper declivities necessitated the building of steel and concrete structures to support the heavy pipeline. Several of these spans are more than 200 feet long. The crossing of the Colorado River was made with an overhead span, but the Kern and Mojave Rivers have submerged crossings of dual 26-in. steel pipe.

• Finishing the welded joint, final welding crew follows stringer crew across the Mojave Desert.

Two Buckeye 51 trenching machines each 50 feet long, 10½ feet wide, and weighing 32½ tons were used to sink the ditch. They are each capable of digging at least one mile a day of the Super Inch trench, which is 48 inches wide and from 5½ to 8 feet deep. They have 32 speeds in four combinations, and may dig from 1.27 to 35 feet per minute.

An undersized Cletrac bulldozer with 44-in. blade was run through the trench to level the bottom. In addition to the bulldozer blade in front, it pulls three attachments — a roller-tiller to break clods of earth, a drag, and a roller.

For lowering-in, nine sideboom tractors were rebuilt to raise their capacity from 52,000 to 78,000 pounds. Frames were made two feet wider, and the axle two feet longer, and the weight of the counter-balances increases from 3,500 to 8,500 pounds.

In the "largest ever built" class were

two Perrault self-propelled pipe cleaning and priming machines, each weighing 7,000 pounds; two Perrault self-propelled pipe-wrapping machines each weighing 12,000 pounds; two Perrault bending machines which bend the pipe wherever necessary to follow the route of the line.

The pipe as it came from the manufacturer — the Consolidated Western Steel Corp. of South San Francisco— was delivered to the railhead plant, in 30-ft. lengths, weighing 2.3 tons each, where they were unloaded and welded together into 60 or 90 ft. lengths, then transported on motor dollies to the pipeline right-of-way. In the field, the 60 or 90 foot units were lined up on skids beside the trench, and then welded into sections 2,000 to 4,000 feet long where terrain permitted.

### Big Bends Made in Plant

Surveyors followed the line and marked each section of pipe to indicate the bends made necessary by the curvature of the terrain. Most of the bends were made by a cold bending machine as acute angles were held to a minimum. When larger angles were necessary, they were made at the factory and welded into the line.

The "double-ending" plant was moved periodically to be near the scene of operations and speed this phase of the work. Handling of the pipe within the yard was facilitated by lift-trucks. Gerlinger 9-ton lift-trucks with fork lift and special hauling devices, handled the units—some of them weighing as much as 7½ tons—with ease.

In the field, each 60 or 90-ft. length was progressively joined to the section, using an internal lineup clamp. Crawler tractors with side-boom slings lifted and held sections in position while the alignment was made, and the welders ran the first stringer weld. As they proceeded to the next section, other welders finished the welded joint.

Finished sections were then cleaned and given a cold prime asphalt paint by a self-propelled pipe-cleaning machine. The same machine applied a coat of thin asphalt primer and wiped it to a smooth glossy finish.

Sideboom tractors with rubber roller cradles held the pipe clear from skids on the ground, as both the cleaning and wrapping operations were performed.

The major portion of the pipe was

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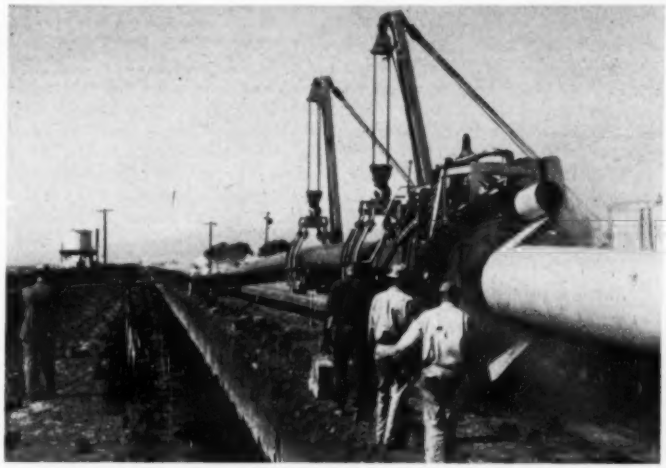
• Buckeye 51 trencher digging through the Panoche Hills is 50 feet long, 10½ feet wide and weighs 32½ tons. Two such machines were used to cut a ditch for the Super Inch.



• Perrault self-propelled wrapping machine at work near Hollister, San Benito County. While sideboom tractors lift pipe, machine applies a coat of asphalt, a first wrapping of asphalt-impregnated paper, a second coat of asphalt and a final wrapping of kraft paper.

• Crossing the Mojave Desert, Caterpillar D8 tractors with Trackson sidebooms handle the pipe while Perrault self-propelled primers and pipe wrappers apply two layers of paper and two layers of hot dope.

# New Shackles on

• Dual operations and train loading methods on Missouri River flood control project speed excavating work considerably. An International TD-24 with Bucyrus-Erie B-170 scraper prepares to deposit a load in the wake of a TD-18 drawn Le Tourneau sheepsfoot roller. At right, TD-24 drawn Bucyrus-Erie and La Plant Choate scrapers are aided by a pusher as they peel off heavy loads.

By Vollie Tripp

Train-loading with tractor-scraper spreads, J. D. Armstrong Co., Inc., Ames, Iowa, handles $476,000 in Corps of Engineers contracts covering levee and diversion basin construction along the banks of the unruly Missouri River.

• Right: International TD-24 drawn Bucyrus-Erie B-170 scrapers pick up over 30 yards of sandy clay in a typical train-loading operation. Average loading time under such procedure is 30 to 45 seconds.

• Below: TD-24 drawn Bucyrus-Erie B-170 scraper spreads wet, sandy clay for compaction by LeTourneau sheepsfoot tamping rollers.

• Below: Seeking to maintain maximum operating efficiency on each job, J. D. Armstrong uses his own plane to deliver replacement parts directly to Foreman Harlan Nibe.

# the "Big Muddy"

FOR years the Missouri River has gone on periodic sprees of destruction, thwarting man's efforts to control it, laying waste hundreds of square miles of valuable crops, sometimes destroying lives. Aroused to the futility of halfway measures the people living along its basin and the Corps of Engineers, U. S. Army, have now arrayed against it the greatest concentration of men and machines ever used before. The engineers believe they will succeed in putting an end to the "Big Muddy's" depredations.

Along the east bank of the river near Rockport in Atchison County, Mo., major levee construction work is proceeding at a rapid pace. Part of the Missouri River Flood control for Agriculture, it will eventually extend from Sioux City, Iowa, to St. Louis. On the Atchison County front the work is going on from the Brownville Bridge to a point approximately 34 miles downstream. Work on tributaries here, chiefly Rock Creek, totals another 26 miles or so. Ten contractors have portions of the work. This article deals with the two contracts of the J. D. Armstrong Co., Inc., of Ames, Iowa.

### Dig 70-Ft. Channel

At Rock Creek, a sluggish stream cutting across the Missouri River Valley, Armstrong has a contract for construction of section 20 of Agricultural Levee Unit L-550, calling for excavating a channel 70 feet wide, six feet deep and three miles long. Approximately 747,400 yards of sandy clay will be excavated from the channel and used for construction of levees on each side of the channel. The 70-ft. wide channel refers to the actual water course of the creek. The distance between the center-lines of the levees is 312 feet, with an average height above the land of 15 feet.

Designed by the Department of the Army, Corps of Engineers, Omaha, Neb., this tie-back levee will serve a

• Here is complete operation of loading, spreading, and compacting. In the borrow pit at left, La Plant Choate C-8C scrapers load dirt and make a left turn to follow 15-yd. (struck) Bucyrus-Erie B-170's dumping material on new levee. On the far side of Rock Creek a ¾-yd. Koehring dragline works in the channel. J. D. Armstrong's Navion is parked on landing strip at right.

• Foreman Harlan Nibe directs operator spreading load of material for new levee as second unit moves into position. In background another Bucyrus-Erie B-170 with TD-24 power front and back is about to take a slice of the "black gumbo."

dual purpose: (1) To hold back rising waters of the Missouri River when it is in flood stage; and (2) to create a basin for the water that drains into the Missouri River through Rock Creek, so that the water which falls locally will form a small reservoir.

### Two Spreads Move Dirt

This job, when analyzed, lent itself to the use of tractor and scraper operations as well as a certain amount of excavation to be handled by draglines. Working under the direction and supervision of the Corps of Engineers, the Armstrong Co. decided that two spreads of tractors and scrapers with identical subsidiary equipment would be used. Each spread has four tractors with scrapers, one crawler tractor for pusher, one with a dozer, and one with a two-section sheepsfoot roller, as well as one ¾-yd. dragline.

Further study of the job prompted use of two ¾-yd. draglines instead of one large 2 or 2½-yd. machine. The reason for this decision was: (1) Greater mobility, as no crossings were available from one side of the job to the other; (2) ground conditions were such that ¾-yd. draglines could be used without mats most of the time; and (3) two machines could produce more yardage for the investment in comparison to one larger machine. As a consequence, the job was divided into two adjacent operations separated by water with identical equipment insofar as size and numbers were concerned.

One crew is working with a fleet of five International TD-24 and two International TD-18 crawler tractors, two Bucyrus-Erie B-170 and two LaPlant-Choate scrapers and one Koehring 304 dragline powered by a UD-16 International engine, and equipped with a ¾-yd. Hendrix bucket and a 50-ft. boom.

The other unit is composed of five Caterpillar D8's, an International TD-18 with bulldozer, a TD-24 and a Koehring 304 dragline. The tractors are working two S-152 Bucyrus-Erie scrapers and two LaPlante-Choate scrapers. These crews are working 10 and 11-hour shifts six days per week.

The two Koehring draglines, which are moving approximately 100 yards per hour, are being used exclusively in handling all material wet and below water. Purpose of this dragline operation is to eliminate working tractors and scrapers in wet and boggy conditions. Work done by draglines assures peak production for the tractor-scraper units.

A feature of which the foremen on the job are continually conscious is the train-loading operation of tractors and scrapers. Under such procedure all units are helping each other load as well as being assisted by a crawler pusher.

### Favors Train Loading

Train loading, according to J. D. Armstrong, president of the J. D. Armstrong Co., Inc., increases efficiency of tractor and scraper operations about 15 to 20% as well as being easier on the equipment.

This train loading is possible without damage to the equipment by the development of synchromesh transmissions such as those installed in new model tractors, Armstrong said. Statistical reports on this job indicated the International TD-24's were averaging 4½ minutes per load cycle on an average haul of 750 to 1,100 feet. Loadings during one week averaged from 511 to 635 per day of 11 hours worked.

### Dry Muck for Fill

On the Rock Creek job Armstrong decided to dump the slimy muck on the inner berm of the levee, letting it dry

• Mounted on an International truck, this Hobart welder, equipped with arc and acetylene torches, is ready to make repairs in the field.

• La Plant Choate and Bucyrus-Erie scrapers tear down an old levee as Koehring ¾-yd. dragline with 50-ft. boom casts creek mud on bank. Armstrong has pusher plates mounted on all tractors at this job.

• A few more passes and this old levee will be gone. Armstrong has eight 4-wheel scrapers and 14 crawler tractors at work on this contract.

out before putting it on the levee fill. In other cases where the slime and muck was placed directly on the fill it slid off and interfered with placing and compacting other fill material.

Armstrong's contract on the Rock Creek job was signed in December 1949, the work to be completed in 11 months. This contract was for $190,-682.60, and includes eight culverts, with control type gate valves, located in concrete gate wells, built in the levee.

The culverts are of bituminous coated corrugated steel, and vary from 36 to 54 inches in diameter. They are designed to permit field water to enter the creek through the levee, but to prevent back flow of water from the creek onto the land, when high water in the Missouri raises the level in the creek. The gates will be located at the bottom of the wells, where they can be reached and serviced.

### Mechanic on Each Spread

The equipment and work carried on along the left side of Rock Creek is being done under the direction of Roy Cheek with Lawrence W. Croat as mechanic. On the right-hand side, the operation is under direction of Harlan Nibe, with Ivor DeBruyn as mechanic.

J. D. Armstrong Company's engineering on the project is being handled by Seth Ryan, graduate civil engineer. Ryan's work consists of staking the entire job and laying out all cross sections before and after work, as well as computing yardages produced on a weekly basis.

### Six-Mile River Job

Armstrong's other contract covers construction of Agricultural Levee Unit L-536 on the Missouri River proper. Here Armstrong is engaged in excavating, hauling and compacting for a levee containing approximately 1,063,700 yards of embankment, over a distance of six miles. This contract—valued at $285,930.70 — was signed in May, 1950, and scheduled for completion in November, 1950. It includes two culverts of 72-in. corrugated pipe, with manually operated slide gates and a third 30-in. culvert and gate.

In building the levee itself the first step is to clear trees and debris in its path. For this Armstrong uses his two International TD-18's, equipped with Bucyrus-Erie bulldozers. Next the soil is scarified with a LeTourneau scarifier, to insure bonding with the fill material.

Fill is obtained from borrow pits located in an area running parallel to the levee, on the riverward side, at a minimum distance of 100 feet from the toe of the levee. The pits are generally rectangular, and are dug to a depth of three to eight feet, with gently sloping sides.

Between the borrow pits undisturbed areas are left, known as traverses, at approximately every 500 feet. They serve as roadways in and out of the pits, and will slow the velocity of the river during floods, thereby decreasing erosion. They will in time fill with silt, when the borrow pit area may again be used for farming, subject, of course, to the flood hazard. They will then no longer serve as a means of slowing the river, but dams to be built upstream will take over the job.

### Push Load Tough Clay

The levee is being raised 1,000 feet from the edge of the river, with a 2-ft. freeboard above high water when the dams referred to are in operation. The soil here is officially described as "sandy to sandy loam." The local term "black gumbo" describes it much better. It is about the consistency of red clay, very tough and heavy. In order to get capacity loads into the big 4-wheel scrapers it is advisable to use

*Continued on page 42*

# News from the Field

## Plan 6-Year Works Program

The Philadelphia City Planning Commission has recommended a 6-year program (1951-1956) of public improvements to cost $426,961,500 to meet the city's most urgent needs.

The program schedules highway improvements, including the Schuylkill Expressway, completion of the Market Street Subway Extension and placing in operation of the Locust Street Subway, waterworks improvements, completion of the sewage collection and treatment system, building of incinerators and construction of the airport terminal building. Also included is an accelerated program of redevelopment in blighted areas and improvements to the city's health and welfare institutions.

## Establish Core Library

Transfer of 43 acres of land on the Fort Snelling Government Reservation in Hennepin County, Minn., from the Veterans Administration to the Bureau of Mines as site of the Bureau's new rock core library is announced by Federal officials in Minneapolis. It is located almost equidistant between the Twin Cities. The core library can be easily reached by public service transportation from both Minneapolis and St. Paul.

About 1,500,000 feet of cores—cylinders of rock produced during core drilling for new mineral reserves—can eventually be stored in the new library, which will be operated cooperatively with mining companies and institutions. The Bureau of Mines welcomes the storage of core from private industry and Government drilling projects throughout the Central Northwest and other parts of the country.

Repeated studying and analysis of core is a fundamental part of the search for new iron, copper, lead, zinc and other mineral deposits. Too often valuable core is lost after drilling because of inadequate permanent storage facilities. A library will preserve it for further study, eliminating later unnecessary and costly drilling.

Because the economic importance of minerals is constantly changing, the ultimate value of a core is not always realized. Cores often throw light on minerals originally ignored or believed of little consequence.

During World War II, core from an antimony project upon second examination disclosed the presence of tungsten. A deposit was later developed which furnished about one-fifth of the Nation's tungsten war requirements. With the development of atomic sciences, many old cores were re-examined and found to contain radioactive materials.

The core library is a 60 by 200-ft. fireproof structure. It contains 12,000 square feet of floor space. Further space will be provided as required.

Metal racks for safekeeping core produced by industry and Government and identified according to state will be installed in the building. A cataloging system, which will include detailed information on the core, will be established to assure rapid reference to the material desired.

## Preserve Idle Engines

Contractors, municipalities and highway departments can put their power equipment engines "in mothballs" during idle spells with special oils created for military use within the last 10 years, according to N. T. Brenner, chief fuels and lubricants engineer, tractor section, Gulf Oil Corp. Trucks, bulldozers, snowplows, fire engines, ambulances and other gasoline or diesel driven vehicles in intermittent use will

• Face-lifting for the White House begins with two Allis-Chalmers HD-5G's carefully removing debris which contains valuable souvenirs.

## Dozer Uncovers History

Cautiously removing "valuable" debris from the innards of the White House in Washington, D. C. are two Allis-Chalmers HD-5G's. Sticks and bricks which ordinarily would be nothing but junk have become highly prized souvenirs of the historic executive mansion that is now being completely repaired at a cost of $5,400,000.

So far the HD-5G's have helped uncover clay bricks baked in 1792, and old timbers that carry scars of the 1814 fire when British Red Coats set the White House aflame. A marble box containing two 1902 Washington newspapers, U. S. Coins, four postage stamps and a bottle of Rye whiskey have been found and ordered reburied beneath the building again.

Major General Glen E. Edgerton, executive director of the Commission on Renovation is well aware of the souvenir values already placed on the "old remains" and has ordered tractor operators to exercise great care on the White House assignment. The tractors tread lightly now, careful not to destroy historical mementos that may soon repose above your fireplace or be re-discovered in grandpa's attic trunk.

benefit from these lay-up procedures.

Life is lengthened, operation improved, and cleanliness of internal parts guarded. The necessity of overhaul to correct rusting and corrosion caused by temporary lay-up is eliminated.

Here are directions he gives for best results with gasoline and diesel engines:

Gasoline engines: Drain crankcase when warm, fill to normal operating level with the protective oil, run engine 20 to 30 minutes at ⅓ to ½ normal operating speed. To protect cylinder walls, piston rings and valves, shut off the ignition, spray two ounces of the oil into each cylinder through the spark plug hole while rotating engine by hand or by the starter (at least five complete revolutions of the crankshaft). Apply oil to metal parts of spark plugs including points and threads.

Diesel engines: Follow same procedure for crankcase as with gasoline engines. Remove fuel injectors where possible, and spray at least two ounces of no-rust oil into each cylinder to protect piston heads and valves. Rotate engine as recommended for gasoline engine. Apply oil to threads and bodies of injectors.

Fuel system of all engines: Remove as much fuel as possible from the tank and run the engine without load until it stops for lack of fuel. No fuel should be left in the fuel system during storage.

Spray inside of tank and filler cap threads with protective oil. In addition, thoroughly lubricate engine accessories. Completely drain cooling system.

Protective oils should also be applied to exposed engine metal, such as water pump shafts or places where paint has cracked off, to provide an anti-rust coating.

Since the no-rust oils are formulated to serve for a considerable time in the place of regular lubricants, the engine may be run on the no-rust oil without drainage when it is taken out of storage, until convenient to change.

## Start Big Highway Job

The biggest dirt moving job ever involved in a single Oklahoma road improvement project was let to contract by the state highway commission of that state in November.

It provided for construction of 6.258 miles of roadbed on Oklahoma City's 4-lane urban program on U.S. Highway 66 with an estimated 845,535 yards of excavation.

The contract was let to J. W. Moorman and Son of Muskogee, for $528,-898.


How to DOUBLE EFFICIENCY of your snow removal equipment

(Don't get caught again)

Last winter's big snows proved beyond doubt that La Crosse trailers can practically *double* the efficiency and working range of slow-moving snow plows, dozers, loaders, etc. By purchasing *extra* trailers now, you can move your big equipment where it's needed FASTER . . . get it working QUICKER . . . on to other jobs WITHOUT COSTLY DELAYS. Moreover, you keep your investment low . . . have extra trailers for year-'round utility.

You'll find heavy-duty La Crosse low boys especially well fitted for winter hauling because they *trail easier on slippery roads . . . are easier to load and unload . . . have extra-capacity, flat-platform gooseneck for carrying spare tires, sand, cinders, etc.* Choice of single, dual or tandem axle design from 6 to 67 tons capacity—standard or custom-built. May we discuss your requirements . . . now?

LC-9R

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LA CROSSE TRAILER CORPORATION, La Crosse, Wis.

Send full details on La Crosse ☐ Tilt Trailers ☐ Standard Low Beds

We may be interested in a.....ton trailer about.....

for hauling.....
(Type of load)

Name.....

Occupation or business.....

Address.....

City.....State.....

LaCROSSE

America's Favorite LOW BED TRAILER

# GUTS

When two-legged people have guts, they finish the fight and do the job.

Real guts—that's what the world admires—man or machine.

You can't define what makes guts in a man, but you can "analyze" the fighting, working, dogged innards of the Champ. So let's put the X-ray on the TD-24:

**Drawbar Horsepower:** 148 working horsepower delivered at the drawbar in official tests.

**Synchromesh Transmission:** you "shift on-the-go," with eight speeds forward, eight reverse for faster time cycles with more pay dirt per cycle.

**Instant Speed Change:** up or down one speed without declutching.

**Planet Power Steering:** all turns are easier . . . pivot turns, feathered turns, turns with power on both tracks.

**Reserve Torque:** gives the Champ the lugging ability to fight through temporary overloads.

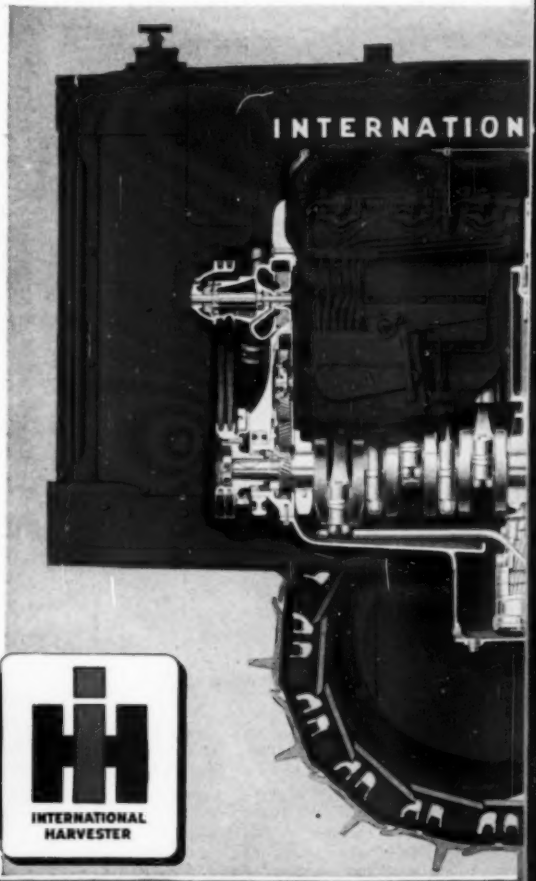
**Easy Steering:** finger-tip hydraulic controls.

**All-Weather Starting:** push-button, gasoline-conversion starting—an International exclusive—gets you on the job fast.

**More Work:** the TD-24 is doing more work—with more speed and more lugging ability—than any other crawler tractor on the market.

Look it over. Then ask your International Industrial Distributor to show you what it can do for you. You'll be a TD-24 man from then on in.

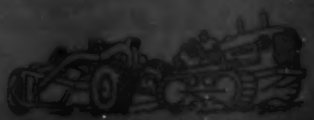
**INTERNATIONAL HARVESTER COMPANY**
**CHICAGO 1, ILLINOIS**




**POWER THAT PAYS**

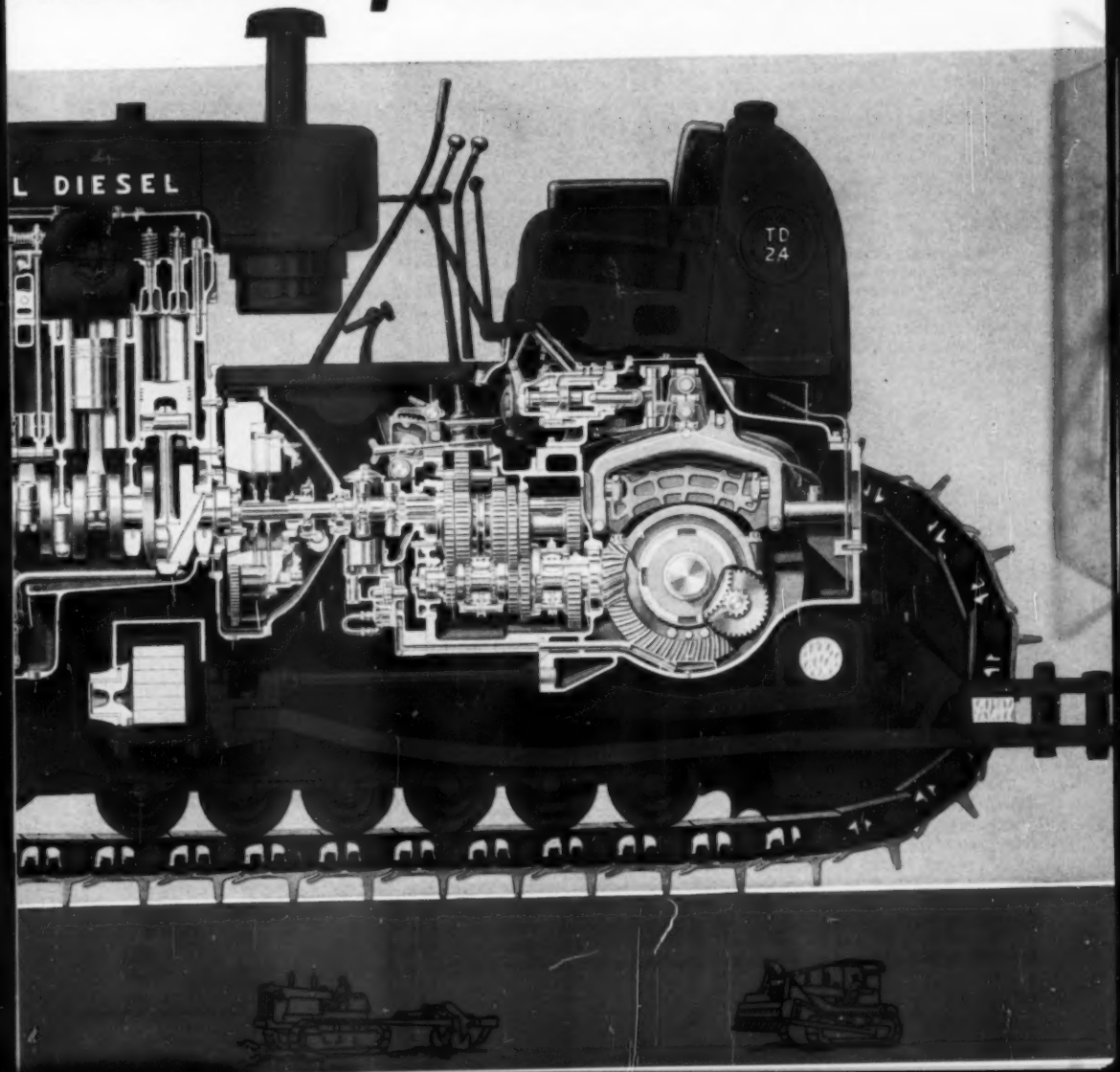
# INTERNATIONAL

INTERNATIONAL HARVESTER



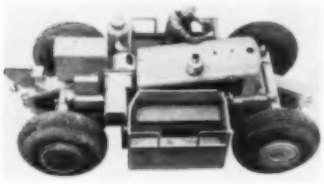
# OF A CHAMP

## inside story of the TD 24



# Equipment You Ought to Know About

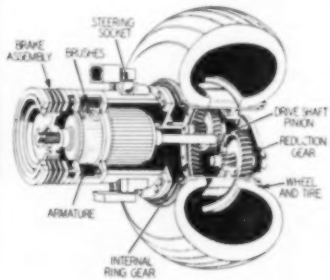
## Electric Drive Tractor



*Manufacturer:* R. G. LeTourneau, Inc., Peoria, Ill.

*Claims:* A diesel-electric machine with no clutch, no transmission and no differential and which incorporates a new method of power transmission for heavy equipment is powered by a General Motors 186-hp diesel engine. Two generators, one alternating current and one direct current are mounted in line with the engine. The DC generator supplies power to each of the four wheels and the AC unit supplies power for steering and the auxiliaries.

Connection between the tractor's power plant and the motors is through flexible electric conductors, and the motors are placed at the points of application. Each drive wheel is suspend-




ed on ball and socket type bearings with drive motor, reduction gear train, drive gear and wheel built as a single unit. There are only four moving parts in each wheel.

The regulation of the flow of electric current from the generators to the wheels is accomplished through a potentiometer type rheostat. The throttle for the diesel engine is advanced to turn the generators at the required speed, and once opened, further operation of the throttle is unnecessary.

The combined AC and DC systems make the unit available as an auxiliary power plant. Welding equipment, project and base lighting and other electrical facilities can be handled by the generators.

The tractor is not yet scheduled for large scale production and will probably see use as a military machine before being made readily available to the field.

## Hydraulic Digger

*Manufacturer:* Sherman Products, Inc., Royal Oak, Mich.

*Claims:* Heavy-duty digger that is lightweight and easy to move works behind a tractor, with the hydraulic pump, independently mounted, operated from the power take-off shaft of the tractor. All digger motions are hydraulically operated. It has a below ground surface reach of eight feet and a 10-ft. digging reach behind the tractor with a 140° swinging arc. The bucket can be raised high enough so as to load any standard size dump truck.

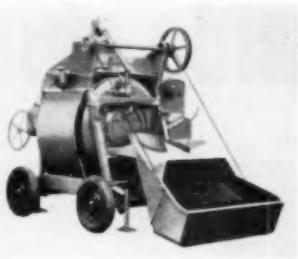
The standard hoe-type shovel cuts an 18-in. wide trench and has a capacity of 3.5 cubic feet. The unit can be installed on or removed from a tractor in 15 to 20 minutes.

## Mixer Improvements

*Manufacturer:* Kwik-Mix Co., Port Washington, Wis.

*Claims:* Improvements affecting both the design and performance have been added to a new, heavy-duty type model 16-S concrete mixer. In construction features, the new 3-bag mixer is designed with heavier frame sections, coil spring mounting and cast steel drum heads having machined roller paths. Drum roller shafts revolve on larger, internal double row, self-aligning ball bearings mounted in pillow boxes attached to heavy trusses securely welded to the frame.

In addition, the 27-hp gasoline engine comes equipped with a clutch and a spring loaded hoist clutch is kept in

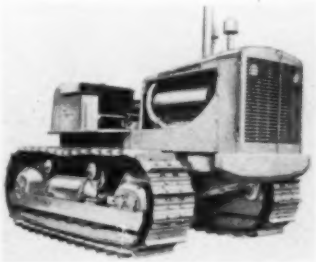


constant proper engagement to eliminate the need for frequent adjustments. Contact points on each end of the charging skip supporting bar are now provided for the selective skip shaker to produce a positive vertical action for faster results.

## Large Tractor

*Manufacturer:* Allis-Chalmers Co., Milwaukee 1, Wis.

*Claims:* Torque converter equipped tractor, the HD-20 has 2-cycle GM 6-110 diesel engine. Positive-seal, grease packed truck wheels, idlers and support rollers are serviced at the factory and thereafter require greasing attention only once every 1000 hours.



## Bulldozers

*Manufacturer:* Baker Manufacturing Co., Springfield, Ill.

*Claims:* Specifically built to work with the Allis-Chalmers HD-20, the Baker bulldozers, gradebuilders and root rippers are available in both hy-

draulic and cable-controlled models. Design feature of the new Baker attachments is the fingertip control achieved through the short linkage between the blade control lever and hydraulic control valve. The reduced number of working and wearing parts in the short hydraulic linkage enables the operator to feel the changes in blade position and maintain full positive control with greater ease.

Other units manufactured by Baker for specific use with the HD-20 are sheepsfoot tamping rollers, heavy-duty road rippers and power control units.

### Crane Shovel

*Manufacturer:* American Steel Dredge Co., Fort Wayne, Ind.

*Claims:* Heavy-duty ½-yd. Wayne Crane model 20 shovel has a 10-ton lifting capacity with extended outriggers and auxiliary counterweight. The working weight of 30,360 pounds as a shovel seems to indicate extra-sturdy construction for a ½-yd. machine. The model 20 is easily convertible to all front-end attachments. A single engine, gasoline or diesel, supplies motive and operating power.

The model 20 travels, lifts, booms and swings simultaneously or independently. Four-point walking beam suspension provides equal stability while lifting or digging even on rough terrain. Full 360° operation, 7-ft. 8-in. wheelbase and short turning radius facilitate operations in tight spots. Mounted on four sets of dual pneumatic tires, the machine travels at speeds up to 15 mph.

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STEEL SHEET PILING?
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LARGEST STOCKS IN U. S.
ALL LENGTHS & ALL SECTIONS TO MEET ALL YOUR NEEDS
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Foster's new lower rental rates on all standard piling sections give you a low fixed expense as an added advantage when you bid on jobs; and you also get the FOSTER GUARANTEE.
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Move more yardage Easily . . . . . at lower cost

with a

# Sauerman machine

Above is the pit and plant of the Albuquerque Gravel Products Co. with a 4 cu. yd. Sauerman Scraper digging and hauling the 250 t.p.h. needed to keep the plant humming.

**It reaches far . . . digs powerfully . . . hauls rapidly**

There's one sure way to cut costs on long range material handling—use a machine that does the whole job without help—a machine that digs, hauls and dumps in one continuous cycle.

Sauerman excavators are of two main types—power drag scrapers and slackline cableways. Either of these two machines will span a large area and move material at a rapid rate from point to point anywhere within that area, under finger-tip control of one operator.

Of the two machines, the Sauerman power drag scraper has the wider application as a general purpose excavator and stockpiler. The slackline cableway finds its greatest usefulness when the job calls for digging deep, particularly under water, and lifting to a high delivery point.

Both machines are alike in their simplicity, ease of operation, moderate power requirements, low maintenance expense and their ability to work on any kind of ground.

Every Sauerman machine is carefully engineered and constructed to give long, trouble-free service and to stand up under tough digging and heavy loads. Many Sauerman machines in operation today have been running for more than a quarter of a century and still are considered just about as good as new by their owners.

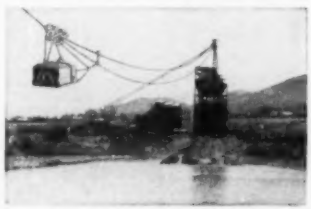
Write today for our catalog. If you have a material handling problem that is bothering you, tell us about it and our engineers will give you their ideas as to the equipment and methods best suited to your requirements.

**HILLSIDE EXCAVATION**

The picture shows how a Sauerman scraper digs into a hill of hard-packed glacial gravel and moves the gravel to a crushing and screening plant.

**STOCKPILING SIMPLIFIED**

Small Sauerman scraper handles seasonal storage of 30,000 tons of surplus output annually at crushing plant, piling the surplus material in a single long pile and later reclaiming to a car-loading hopper.



**DIGGING UNDER WATER**

Here is a Sauerman slackline cableway moving gravel out of a deep pit 400' wide by 900' long which it dug during the last two seasons while producing about 300,000 cu. yd. a season.

Rope Haulage Equipment Specialists Since 1909

**SAUERMAN BROS., Inc.**

574 S. Clinton St. Chicago 7, Ill.

**McCarthy**

**MOBILE-MOUNT VERTICAL DRILL FOR BLAST HOLE DRILLING**

McCarthy Vertical Drills are compactly designed for truck, half-track or caterpillar mounting. They adapt to any job where soft rock formations are to be removed, and their tough, simplified construction means bigger profits through reduced drilling costs and increased drilling speeds.

McCarthy Drills are equipped with plenty of power and finger-tip controls. They're easy to set up and easy to move about.

See your McCarthy Dealer today or write us direct for complete information. Our 48 years of experience can mean vastly increased profits for you.

*Makers of Drilling Equipment Since 1901*

SALEM

**THE SALEM TOOL CO.**

773 SOUTH ELLSWORTH AVE.
SALEM, OHIO, U. S. A.


## More Water

*Continued from page 17*

the high pressure nozzles, control of the moisture in the spray apparatus is within one-half of 1%. The engineer on the job can specify the amount of moisture needed for compaction and loads can be moistened to exact requirements.

The clay hauling job is handled by eight 15-yd. bottom dump Euclids making an average haul on the whole job of 2.7 miles loaded. The company found it easier to move the portable clay plant than to make long hauls from pit to feeder.

For the compaction job in the bottom of the canal, a sheepsfoot tamper of special design and built in the company shop was used. It is built of two 5-ft. drums, weighs 43,000 pounds loaded and does an excellent job securing a minimum of 90% compaction with 10 passes.

### Tailormade Tamper

For the 8-ft. wide clay lining on the sides of the canal, the Bureau engineering staff specified a compaction of six feet of the total width. To do this job, Fisher's Phoenix shop superintendent, John Woylan, cut up another tamper to make a single drum special sheepsfoot which is 6-ft. 10-in. to insure a minimum pack of six feet.

As the side lining is built up the Eucs drop their loads down the center of the 8-ft. wide lift and a Caterpillar D6 bulldozer equipped with a special wing to keep the material from overspreading smooths it out to a 6 to 10-in. layer ready for compaction.

In addition to the 385,000 yards of clay lining Fisher is using on the canal, the company placed 5,000 yards of concrete in the check and turnout structure at the diversion point, drainage structures, bridges and canal lining. Other concrete work includes bridges over the canal to carry the network of roads, abutments for surface drainage spillways and various siphons and outlets. To handle these pours, most of them small yardage jobs, the company used a Noble 4-compartment, 100-yd. batching outfit and a Noble bulk cement batching plant. Concrete was mixed using three transit mixers which were most efficient on the scattered pours. Most of the concrete was placed with a Link Belt Speeder model 70 rubber-mounted crane handling a ¾-yd. bucket.

Officials in charge of the job include Del Fisher, president of the company, Foy Pickering, general superintendent and R. A. Russell, project superintendent. Carl Jacobson supervised the concrete work.

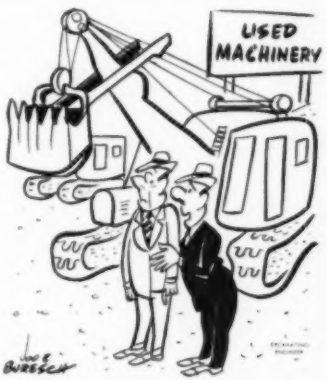
### M-K Contract Includes Tunnel

The next stretch of the big ditch is being opened by Morrison-Knudsen on a $1,500,000 contract. It is a 9.4 mile concrete-lined section with a 16-ft. bottom width to carry a 12.8-ft. water depth. The section begins at an elevation 31 feet above the clay-lined section and four miles later jumps up another 84 feet. In addition the M-K job requires a 241-ft. tunnel 18 x 18 feet under the double tracked main line of the Southern Pacific Railroad.

On this job, a new method of chemical soil stabilizing developed recently in California was used by M-K for the first time, the process being handled by Jack Binder, project superintendent. The chemical stabilizing process uses two chemicals injected into the soil under a pump pressure of up to 1,000 psi. Binder used the process to stabilize footings for tunnel liner bearing plates saving the excessive cost of attempting to shore up loose ground under difficult conditions. The solutions used are not expensive.

The ground was broken in the tunnel using air shovels in each side and piling in center muck piles. The muck was moved out with a fresno and block pulled by a Caterpillar D6 working outside in the bottom of the canal.

Putting the big bite on the 2,042,000 yards of dirt being moved, is a new Bu-




"This one belonged to an elderly contractor who only did a little ditch work on Sunday afternoons."

On Any Job...
Bucyrus-Erie Bullgraders and Bulldozers Are Standouts for Earthmoving!
TD-24 Cable Bulldozer
TD-24 Cable Bullgrader
Hydraulic or cable-controlled, Bucyrus-Erie Bullgraders and bulldozers pace the way to greater output on hundreds of construction jobs. They're sturdily built to stand up to hard work. They're quickly responsive to operator demands. They're easy on the tractor because their balanced design puts loads where the International Harvester tractor is designed to take them. To move more dirt and move it faster, always choose Bucyrus-Erie Bullgraders and bulldozers!
Bucyrus-Erie Co., South Milwaukee, Wis.
SEE YOUR
INTERNATIONAL Industrial Tractor Distributor
TD-18 Hydraulic Bullgrader
TD-6 Hydraulic Bulldozer
TD-18 Cable Bulldozer
TD-9 Hydraulic Bulldozer
BUCYRUS ERIE
TD-14 Cable Bullgrader
TD-14 Hydraulic Bullgrader

cyrus-Erie 200-W dragline. The big walker swings a 7½-yd. bucket in sand and a 6-yd. bucket in clay from a 125-ft. boom. The digging is to an average depth of 35 feet through a group of low hills with 54 feet the maximum cut.

### Dozer Sprouts Wings

Teamed up with the big rig is a Caterpillar D8 dozer with wings! Wings on the dozer have speeded up the dirt moving operation by 2,000 to 3,000 yards per day. The wing deal consists of two 15-ft. angled wing extensions mounted on each end of the dozer blade. The wings were designed and built at the company shops by Everett L. Christman, former canal project superintendent and Ruben Anderson, master mechanic. They are built of 8-in. channel iron and the blades can be changed. The angle is adjustable allowing slope variation of from 3/4:1 to 2:1. With the wing dozer-200-W combination, M-K is finishing the canal to exact size. The bucket cuts to within two feet of finished requirement and the dozer makes the final shave pushing the dirt and sand up to the bucket. The combination handles from 10,000 to 12,000 yards per day.

At some places along the bottom of the canal, a 2½-yd. Northwest 95 dragline was used to build up the cut where the ground was too low. Fill was compacted with an 8-ft. double drum sheepsfoot packer with a maximum of 10 passes. Fill was packed by sprinkling each lift. Tank sprays were mounted on two International I-K8 10-wheel tanker units and four rented water tankers.

### 9.4 Miles of Concrete Lining

Since the 9.4-mile section is concrete lined all the way, M-K has installed a complete semi-automatic batch mixing plant designed and built by the Conveyor Co. of California and using Conveyor Co. belt conveying assemblies. The mixing plant is a 4-compartment, 16-ton batch plant which will average from 600 to 800 yards daily.

Trapping is done by a D8 dozer to an 8-in. grizzly. The grizzly feeds a Telsmith primary 18 x 22-in. jaw crusher powered by a Caterpillar D13000 engine through a pan feeder.

The primary product is fed to a Telsmith cone, crushing to minus ¾-inch. The cone is also powered by a D13000 unit. The washing unit was built in the M-K shop and does a good job of reclaiming the fines using a simple sand drag. The crushing plant is producing from 800 to 900 tons per day of sand to ¾-in. gravel.

Material from the crushers and washing plant is stockpiled over reclaiming tunnels. The tunnels are made up of 105-in. Armco Multico plate pipe. The sand tunnel is 110 feet, the aggregate 180 feet long. Material is pulled from the tunnels with 36-in. conveyors to a Symons vibrating screen 5 x 12 feet, which yields from ¼ to 1½-in. products.

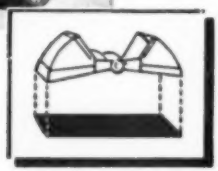
The concrete mixing unit is a newly designed Conveyor Co. Electronic semi-automatic batch mixer with printing scale. Concrete pouring operations thus far have been confined to structure work using 5-yd. Rex Moto-Mixers mounted on three White diesel cab chassis. The batch plant is also furnishing all the concrete for United Pipe and Concrete Company's three pumping installations. The total will be around 65,000 yards of concrete before the plant is dismantled. The crushing plant will produce an additional 20,000 yards of material for road surfacing and gravel blankets.

While M-K will supply the concrete for the lining job on its section, actual lining work is being done by the Western Contracting Corp. of Sioux City, Iowa, which brought in its own batch plant and began working on an additional 29 miles of the canal this winter.

In charge of work for M-K is Jack Binder, project superintendent, R. E. Mayfield is executive superintendent and Steve Miller is construction superintendent. E. W. Weatherman is office manager and job engineer is L. N. Spencer. Bureau of Reclamation field engineer is Clyde E. Shield.


**ERIE *Barge Type* Bucket**

**In this type the large deck area achieved means bigger payloads in stock piling and barge rehandling work. Erie's booklet on 2-line buckets gives you complete data on this type and 3 other classes of Erie Buckets. Write for copy today.**



***Compare* DECK AREA**

| | |
|---|---|
| ¼ Yd. | 27.21 Sq. ft. |
| 1 Yd. | 30. Sq. ft. |
| 1¼ Yd. | 32.3 Sq. ft. |
| 1½ Yd. | 38.7 Sq. ft. |
| 1¾ Yd. | 42.4 Sq. ft. |
| 2 Yd. | 45.1 Sq. ft. |
| 2¼ Yd. | 53.5 Sq. ft. |
| 2½ Yd. | 57.6 Sq. ft. |
| 3 Yd. | 60.9 Sq. ft. |

*Write for Catalog* **2L-1** *Today*

ERIE
STEEL CONSTRUCTION COMPANY
4011 GEIST ROAD • ERIE, PENNSYLVANIA

"Okay, Gus—Lift!"

PLAN

LOAD

DETONATE

For better BLASTING!

WITH PRIMACORD

The many advantages of Primacord make it the choice where safety, simplicity of hookup, and ease of handling are factors to be considered.

Primacord, because of its speed, detonates practically instantaneously, yet the infinitesimal lag between holes and rows of holes obtains greatest results from a minimum quantity of explosives.

Because it cannot be set off by friction, sparks or ordinary shock and is impervious to stray electrical currents, Primacord offers a safety factor to many blasting operations.

Primacord is wound on easy to handle lightweight spools, so that loading and hook-ups are done easily.

## 4 Types of Primacord

Primacord is made in four standard types, each designed to obtain greatest effectiveness under varying working conditions — each with the same high degree of dependability.

**PLAIN PRIMACORD.** For shallow holes and surface trunkline use, Plain Primacord is recommended. Although light in weight (a 1000-foot spool weighs only 19 lbs.) it has tensile strength of 113 lbs.

**REINFORCED PRIMACORD.** For deep holes where extra tensile strength or resistance to abrasion are desirable, depend on Reinforced Primacord. Tough, but resilient and easy to handle, Reinforced Primacord has the same detonating qualities as other Primacord-Bickford types. Weight 20 lbs. per 1000-ft. spool.

**WIRE COUNTERED PRIMACORD.** Armored with closely stranded brass wire, Wire Countered Primacord is the answer to problems involving deep, ragged holes and high abrasive conditions. The wire sheath also increases the tensile strength to 220 lbs. Weight per 1000-ft. spool, 35 lbs.

**PLASTIC REINFORCED PRIMACORD.** To meet the demand for a strong, waterproof detonating cord resistant to abrasion and to the acids commonly encountered, Ensign-Bickford developed Plastic Reinforced Primacord. With tensile strength of 250 lbs., users find it ideal for extremely deep holes, river crossings, or where water is a problem. Weighs 22 lbs. per 1000-ft. spool.

Blasters who use Primacord consistently agree there is no substitute. For complete information, consult your explosives supplier . . . or write to us direct.

**THE ENSIGN-BICKFORD COMPANY**

**Simsbury, Connecticut**

***Also Ensign-Bickford Safety Fuse — Since 1836***

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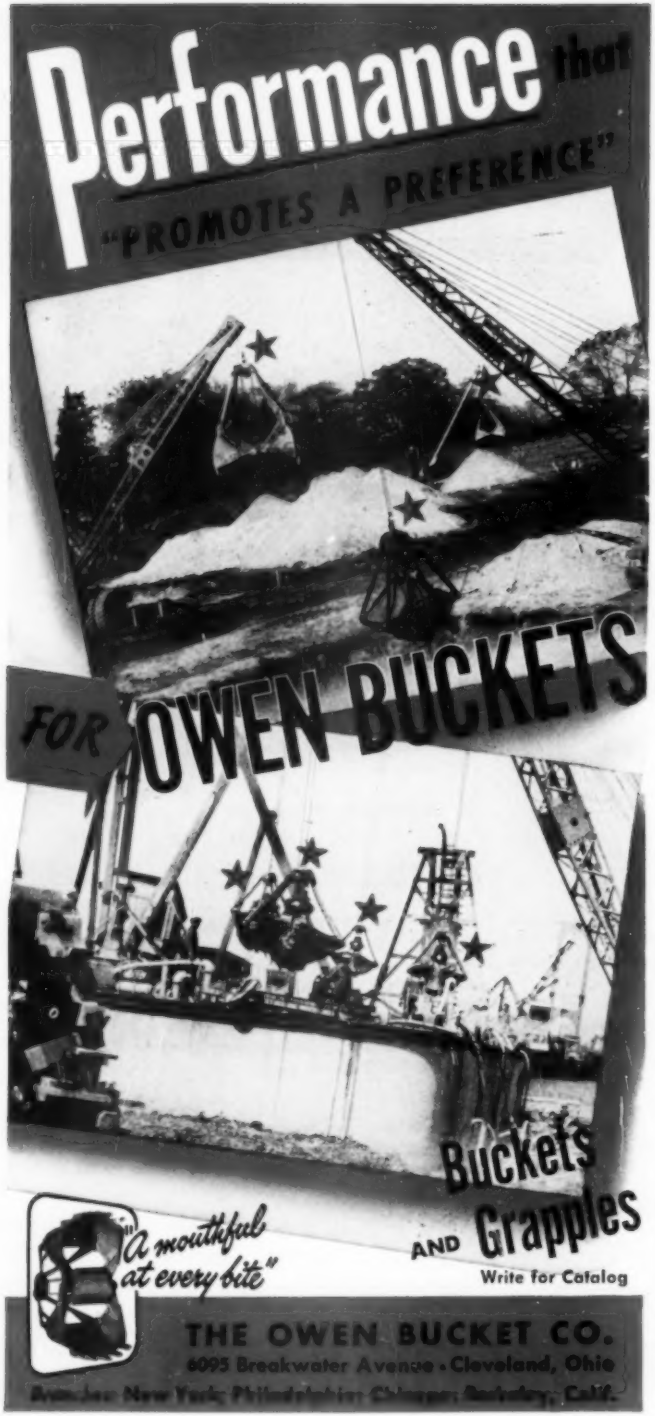
**PRIMACORD-BICKFORD** Detonating • Fuse •





# *Notes* from the manufacturers

**Buda Co.,** Harvey, Ill. announces the appointment of E. R. (Ed) Galvin as merchandise manager. Mr. Galvin has served successively as general sales manager of Caterpillar Tractor Co., R. G. LeTourneau, Inc. and LaPlant-Choate Manufacturing Co., in which positions he gained a wide knowledge of construction practices with both track type and rubber-tired equipment. Mr. Galvin will supervise retail sales through the Buda distributing organization with headquarters in Harvey.

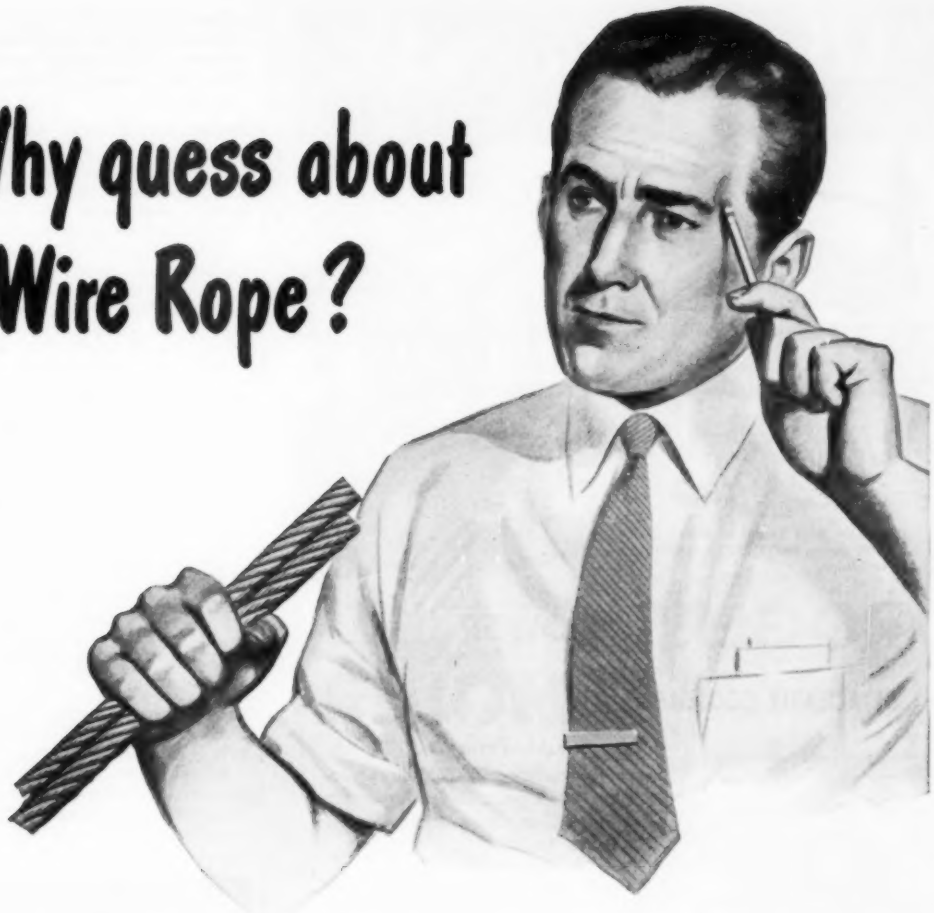
**Twin Disc Clutch Co.,** Racine, Wis. announces the appointment of Paul W. Wahler as service manager and Mr. Robert A. Harmon as dealer sales supervisor. Mr. Wahler joined the engineering department of the company in 1937 and was formerly assistant district manager of the West Coast. In his new duties he will supervise all service operations through the five factory owned parts stations which supply parts to all Twin Disc outlets. Mr. Harmon served as field representative and as

Jaeger Model 125 runs 2 heavy duty or 3 medium breakers at full 90 lbs. pressure, doing 30% to 40% more work than at 70 lbs. pressure from a 105 ft. machine.

Other Jaeger "new standard" sizes, 75, 185, 250, 365, and 600 ft., give you comparable work increases. Cost no more than smaller old sizes. Send for Catalog and prices.

**THE JAEGER MACHINE COMPANY**
553 Dublin Avenue Columbus 16, Ohio

# Why guess about Wire Rope?



Let's call this a picture of a man who used to guess about his wire rope. He often guessed wrong. Was never really sure which brand was costing him the most—and the least.

Now he's keeping records. A Bethlehem man showed him the value of knowing what he was actually getting for his rope dollar. Showed him that the true cost of wire rope is the cost per unit of work—per ton-mile, cubic yard of rock moved, etc. Showed him how easily records could help him determine this cost per unit of work.

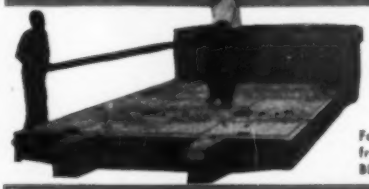
It's something Bethlehem strongly recommends, for purchase price alone is a false yardstick of rope value and rope economy. Frankly, we welcome any steps that will help users compare brands of rope, for the Bethlehem product is built to give outstanding service at very low cost. This is a fact you can prove to your own satisfaction by keeping a few simple records.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

**LET YOUR RECORDS TELL YOU!**

# Like the Camel..
## IT GETS DOWN!



For EASIEST possible LOADING, the frame is lowered to ground WITHOUT BLOCKING.

## FOR EASIER LOADING!

Maximum deck height of ONLY 16 INCHES assures RAPID, SAFE LOADING of equipment.

# ROGERS POWER LIFT
## DETACHABLE GOOSENECK TRAILER

PATENTS PENDING

**5 EXCLUSIVE ADVANTAGES**

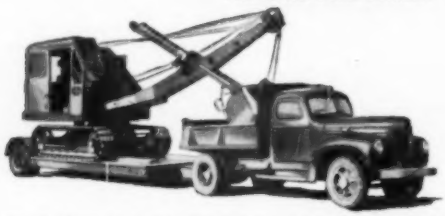
1. Carries heavier loads on larger tires.
2. Detaches quickly for fast, easy front loading.
3. Stoops to clear low overhead obstructions.
4. Raises its deck to clear high banked crossings.
5. Is detached, loaded and reattached in 5 minutes.

Yes, with this unique trailer you can detach the gooseneck, load up, reattach the gooseneck and drive off in a matter of ONLY 5 MINUTES.

Complete Literature available upon request—Any Rogers Dealer will demonstrate its features right on your desk, with an OPERATING SCALE MODEL.

EXPERIENCE builds 'em — PERFORMANCE sells 'em

ROGERS BROS. CORP.
ALBION, PENNA.
136 ORCHARD STREET



Also of timely interest is this ROGERS Tag-A-Long trailer which makes a dump truck serve as a tractor and effects sizeable savings for contractors.


eastern district sales engineer before promotion to his present duties of coordinating all dealer sales activities. Both men will headquarter in Racine.

**Hyster Co.,** Portland, Ore. has appointed French Mill Supply Corp., Utica, N. Y. Hyster truck dealer in 16 counties of central New York state. Speer and Co., Cincinnati, Ohio has taken over sale and service of Hyster industrial handling equipment in southwestern Ohio, eastern Indiana and northern Kentucky. Another Hyster dealer has opened under the name of Virginia Bearings and Supply Co. in Roanoke, Va.

**Warner Electric Brake and Clutch Co.,** Beloit, Wis. has named Roger H. Brown, Union, N. J. as eastern sales manager for the firm's ICB division. Brown formerly handled engineering sales of the company's industrial clutches and brakes in the New York area. New York sales will henceforth be handled by R. C. Wiard and W. E. Gregg, who will headquarter in Middletown, Conn. Mr. Gregg, who has been associated with the firm for a number of years, formerly represented Warner in the Cincinnati area.

**Hose Accessories Co.,** Philadelphia, Pa. has appointed Price M. Davis, Jr., factory representative for Michigan, eastern North Dakota and eastern South Dakota. He will continue to cover Minnesota, Wisconsin, northern Illinois and northern In-


HAYWARD BUCKETS

WON'T QUIT OR CAUSE TIME OUT

A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

THE HAYWARD CO.
52-54 Church Street
New York, N. Y.

diana. Mr. Davis has been active in the Midwest mill supply field for a number of years, both as a distributor's salesman and as a factory representative.

**Euclid Road Machinery Ltd.** will put a new factory in Scotland into active production in the very near future. The plant will begin with assembly work with parts sent from the U. S. A. Later they plan to develop production facilities to build a full range of Euclid equipment including the largest types of earth moving trucks, tractors, and grabs.

**Caterpillar Tractor Co.,** Peoria, Ill. has named William E. McCoy of Camden, N. J. assistant sales manager of the central division. Since the war, he has been a district representative of Caterpillar in the eastern division. Mr. McCoy succeeds Herman Eberling who recently went on active duty as a captain in the U. S. Corps of Engineers.

**International Harvester Co.,** Chicago, Ill. has started two mobile training units on a nation-wide tour. Each unit consists of an International L-180-series truck with a 32-ft. drop-frame, enclosed semi-trailer, especially equipped for both a service and a sales-training program. Instructors will present the servicing story to district office and distributor service personnel with the aid of charts, slide films, and movie films. Sets of special tools and equipment will be displayed on the walls of each trailer and usage will be detailed during the discussion period.


**Churn Drill BITS may look alike, but...**

. . . the quality of steel used in their manufacture can make a difference. Bucyrus-Erie drill bits are made from special high-carbon steel billets which have been carefully tested and analyzed in our modern metallurgical laboratories for proper toughness and strength. Then the bits are shaped by the most modern forging processes and tempered to the degree of hardness required for the most efficient drilling. The result — a drill bit that has performed at maximum efficiency in all types of formations and in all parts of the world. Use Bucyrus-Erie bits in your next blast hole drilling operation. Write for complete information.

17A81

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SOUTH MILWAUKEE, WISCONSIN



*More than*

**5,000,000**

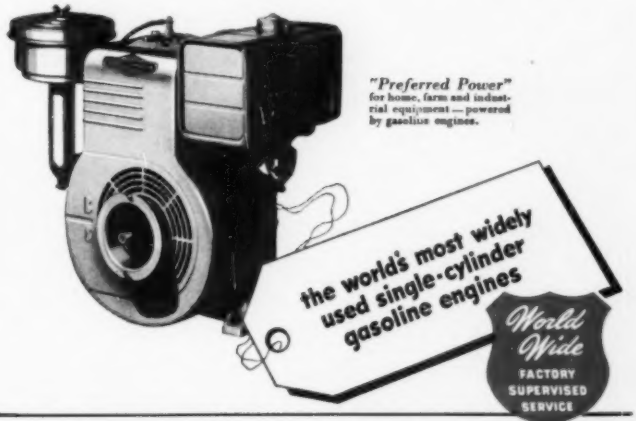
4 CYCLE

**BRIGGS & STRATTON**

GASOLINE ENGINES

The performance record of more than five million Briggs & Stratton single-cylinder, 4-cycle, air-cooled engines speaks for itself.

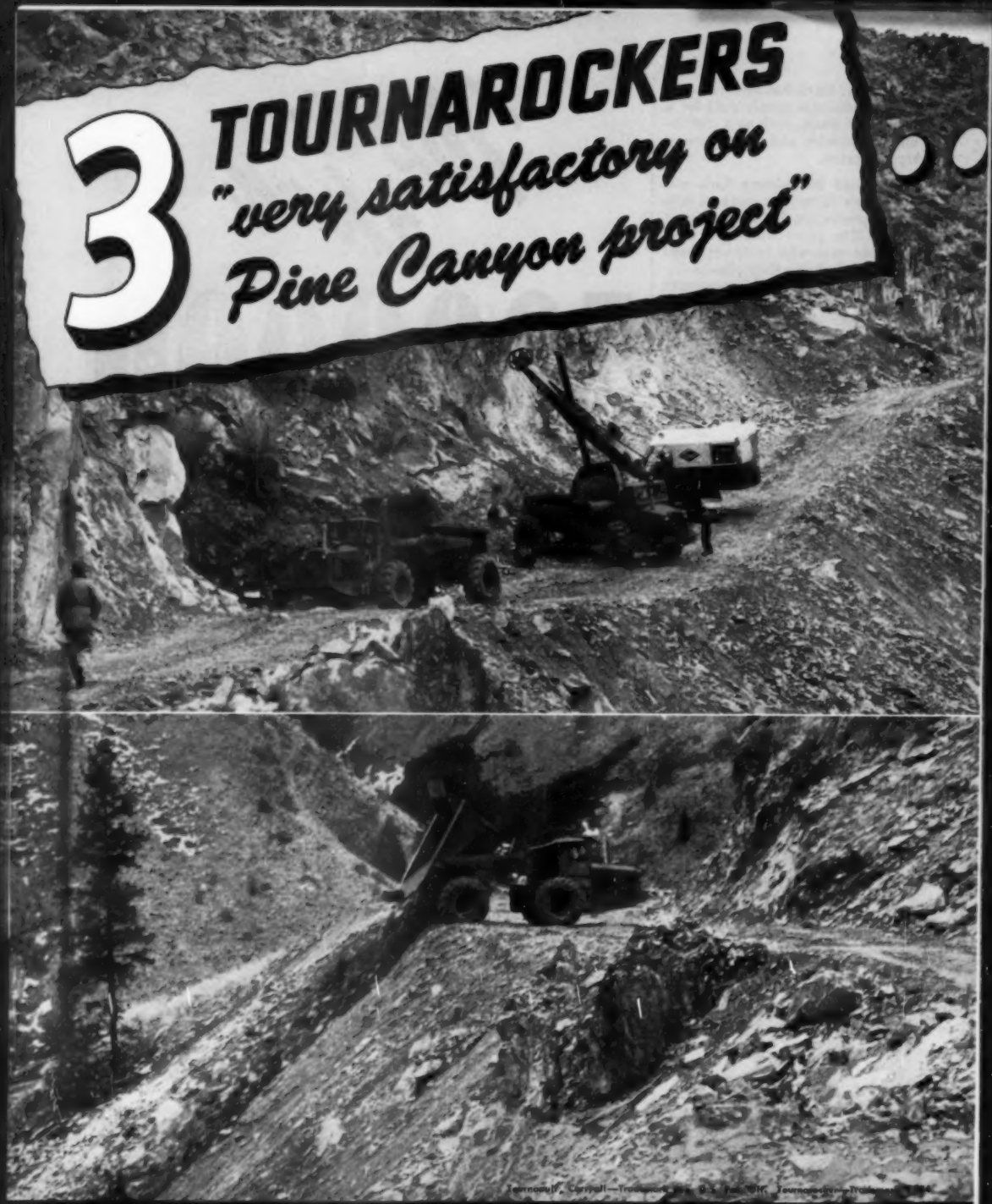
BRIGGS & STRATTON CORP., Milwaukee 1, Wis., U. S. A.




*"Preferred Power"* for home, farm and industrial equipment — powered by gasoline engines.

In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.

# 3 TOURNAROCKERS "very satisfactory on Pine Canyon project"



Tournarocker, Carryall—Trademarks Reg. U.S. Pat. Off. Tournapower—Trademark © 1964

*Mail today to:* **R. G. LeTOURNEAU, Inc., Peoria, Illinois**

NAME _____ TITLE _____

COMPANY _____

STREET _____

CITY _____ STATE _____

Type work _____

- ☐ Send us more information
- ☐ Have Distributor call about: 35 m.p.h., 16-ton Tournarocker

Also interested in:

- ☐ 25 m.p.h., 9-ton Tournarocker
- ☐ 30 m.p.h., 35-ton Tournarocker

# GOODFELLOW Brothers, Inc.,

tackled one of the northwest's toughest highway jobs . . . relocating 4.4 miles of U. S. 2 along steep sidewalls of rocky Pine Canyon, near Wenatchee, Washington. With over 600,000 yards of shovel rock to be carved out of the cliff face, some of the material is side-cast . . . much of it has to be hauled and dumped along the mountainside trail to widen narrow sections. Goodfellow Brothers, Inc., assigned the most difficult hauling to 3 LeTourneau 16-ton, rear-dump Tournarockers . . . and according to James B. Goodfellow "They are working out *very* satisfactorily".

## Here are contractor's own figures

Loading under a 2-yard rock shovel, the Tournarockers carry 9 to 11 bank yards each trip. On one 2800-foot, one-way haul, actual job records show that Tournarockers easily handle shovel production of 1000 yds. every 8-hour shift. This rate of production, day in, day out, helps keep the job on schedule in spite of the rough haul roads, steep grades, and confined hauling conditions at altitudes of 2000 feet.

## 13′ 9″ turn radius speeds handling

Short, 90° turns, and positive electric steer by push-button control, permit easy turning and spotting anywhere along the narrow trail for load and dump position. Oversize, disc-type air brakes on all 4 wheels (4176 sq. in. total braking surface) give operators complete safety throughout the hauling cycle. Positive holding action of 4-wheel brakes . . . plus front-wheel drive on 186 h.p. Tournapull prime mover . . . let the Tournarockers dump safely out over the edge of mountainside fills. Simple electric hoist raises body to vertical position . . . streamlined bowl clears loads instantly.

## Important savings for you

These same revolutionary Tournarocker advantages that are helping Goodfellow Brothers, Inc., lick steep slopes and rough going on the Pine Canyon project offer new low-hauling costs for your jobs, too. Ask your LeTourneau Distributor about this 16-ton, rear-dump Tournarocker. He can also give you complete information on 9-ton and 35-ton Tournarockers . . . and will show you money-saving interchangeability with Carryall Scrapers, bottom-dump hoppers, cranes, flat-beds and other auxiliary hauled units. Your investment dollar provides steady year-round earnings with interchangeable auxiliary units at approximately 25% of the cost of the original unit. Write or call NOW!

**Big target** . . . Operator on Goodfellow Brothers' 2-yard shovel has large target with Tournarocker's 12′ 5″ x 8′ top opening . . . speeds shovel swings, has less spillage.

**Rock body** . . . Here's a typical load of big-chunk rock carried by Tournarockers along Pine Canyon's slopes. 186 h.p. for 16-ton capacity licks the toughest hauling conditions.

**90° turns with positive power steer** . . . Short 13′ 9″ turning radius is an important advantage where operators have to turn and dump their loads along these narrow trails.

**Front-wheel drive** . . . Means you can keep the drivewheels of the prime mover on firm ground. Front or rear wheel air brakes can be set independently.

LETOURNEAU PEORIA, ILLINOIS TOURNAROCKERS

HIGH SPEED on RUBBER PLUS TRACTION ADVANTAGES of a CRAWLER

## New Shackles

Continued from page 25

pushers. The contractor uses D8 Caterpillars and International TD-24 crawlers for this work. In fact all of his crawler tractors are equipped with pusher plates, made by Armstrong Heavy Hauling Corp. of Ames, Iowa—another of the contractor's ventures.

"This is one job where everybody helps everybody else," said J. D. Armstrong. "We don't go in for team rivalry. If a guy is having trouble, or getting behind, someone slips up and gives him a push."

Included among the scrapers on these two jobs are three 15-yd. (struck) Bucyrus-Erie B-170's, two LaPlant-Choate 86's, one 13½-yd. (struck) Caterpillar 80, one 8.7-yd. (struck) Caterpillar 70, two Bucyrus-Erie 13½-yd. (struck) S-152's and two LaPlant-Choate 314's.

### Look for 15,000-yd. Day

The capacity of the machines varies with the nature of the material. Mostly it breaks up into huge clods, some of them as big as a barrel. Best day's work saw 12,600 yards of dirt moved and compacted into the fill. This was done with all rigs working. Armstrong hopes to hit a 15,000-yd. average soon.

Length of haul varies from a few hundred feet to half a mile. The men work six days a week, 11 hours per day. Armstrong believes in letting the scrapers dump quickly, and go back to the pits, leaving the bulk of the spreading to be done by the dozers.

One of the problems has been to get fill material dry enough to compact properly. Where there is an excess of moisture in the gumbo the pits are stirred up to a depth of 28 to 30 inches by a LeTourneau model K scarifier, pulled by a D8 or TD-24.

### Compact with Three Rollers

As the scrapers dump their loads and the dozers shove it around, sheepsfoot tamping rollers begin compacting the fill. Three tampers are used. Two 8-ton LeTourneaus and a 7-ton American, model AD 132, weighted to 10,640 pounds and exerting a pressure of 250 psi. The rollers are pulled by TD-18 tractors.

The levee will be 120-150 feet wide at the base, tapering to a 10-ft. crown, and will average 15 feet above the surrounding land. To prevent or reduce danger from sand boils a landward berm is laid against the toe of the levee, about 70 feet in width. The berm is compacted to the same degree as the levee.

Sand boils may occur when the levee is subjected to great pressure from flood water. The water forces a passage under the levee and may erupt far on the landward side. The boils are much more difficult to repair than an open rupture. The well compacted berm is expected to minimize danger from this source.

Last step in building the levees is dressing them down, and seeding. All levees on the river and tributaries will be planted to a mixture of rye, crested wheat, alta fescue and smooth brome. It will be drilled or sown by ordinary farm methods. The grasses act as a nurse crop for the brome and fescue, giving it needed protection until it has had time to root well, and create a strong sod. Trees will not be permitted to grow upon the levee.

### Gets Good Tire Mileage

Armstrong has Goodyear and Firestone tires on his equipment. Due to the absence of rocks and abrasive gravel he gets good mileage from the tires. Now and then a snag occurs, but he estimates they will last from four to five years on this kind of work. Air pressure is kept at 40 to 50 pounds, depending on the load.

Speaking of tires, Armstrong is a believer in plenty of rubber. "All of our tires are oversize, and most of them are 20 ply. You get much better traction and flotation with oversize tires on this kind of ground."

To service the equipment Armstrong likes to divide the machines into groups or spreads of three scrapers, with a mechanic to each spread. For on-the-spot maintenance he has a Hobart portable electric welder with both arc and torch available mounted on an International truck. On the job also are seven pickups — four Internationals, two Fords, one Dodge. Standard fuel and oil are supplied by a Rockport company. The Corps of Engineers maintains a field office at Rockport and many of the levee workers have temporary homes there.

### Flies to Job

Another valuable machine on the job is a Ryan Navion four seated airplane. The Navion has proved especially valuable in getting repair parts when need-


**Better Lighting For Your Work With This Rugged STURDILITE**

**HEAVY-DUTY FLOOD LAMP**

***BUILT TO TAKE IT*** **— Specially designed for extra efficient, long-lasting service on —**

***SHOVELS-EXCAVATORS-DRAGLINES-ROAD BUILDING EQUIPMENT-LOCOMOTIVE CRANES-TRACTORS***

**Extra high light intensity and spread from sealed-beam unit. Entire assembly mounted on rubber cushioned base to absorb vibration and shocks. Fully proved by years of trouble-free service. Available in 6-8; 12-16; 24-28; and 110-120 voltages.**

**ILLUSTRATED BULLETIN, detailed specifications, and prices sent upon request.**

**PHOENIX PRODUCTS CO. *Metal Spinning Div.***

**4723 N. 27th Street** **Milwaukee 16, Wis.**

ed in a hurry. "Many times we have been able to get the new part back before the mechanics have the old one off the machine," he said. "We do not have to carry a heavy inventory of spare parts. I think we have saved the price of the plane in this one item alone."

J. D. Armstrong — now a youthful 38 — has been in the excavating business since he was 24. The turning point of Armstrong's early dirt-moving business was reached while he was at the Des Moines Ordnance Plant, where he was superintendent of all earth work.

As he encountered continued demands from his own and other construction firms for the efficient movement of heavy equipment from one project to another, he organized Armstrong Heavy Hauling Corp. This business grew until it operated under Interstate Commerce Commission regulations in nine states before, during and after World War II.

In conjunction with this heavy-hauling operation, Armstrong developed the manufacturing phase which consists of designing and building of special, heavy-duty, low-bed trailers and pushplates for all types of crawler tractors.

Stressing safety as the big factor of his success in the heavy construction business, Armstrong, who practices what he preaches, last year was signally honored for this conformity when he was awarded a plaque by the Associated General Contractors of America, Inc. for first place in the Group B highway division for accident prevention. He also received a similar safety award that year from the AGC of Iowa. Continuing the record this year, he has lost no time due to accidents on the levee contracts.


SAVINGS FLOW FROM SPEED-LAY PIPE SYSTEM

EVERYTHING for a COMPLETE PORTABLE PIPE SYSTEM

FACTORY PACKAGED • PIPE COUPLINGS • FITTINGS • VALVES ACCESSORIES • LIGHTWEIGHT, SAVES LABOR • FAST, SIMPLE

DELIVERED READY FOR INSTALLATION

*Immediate Installation*

by one unskilled man. 2½ to 12½ o.d. black or galvanized. Larger sizes can be furnished. Ready to lay—without delay.

SEND COUPON NOW!

ALBERT PIPE SUPPLY CO., INC.
Berry & N. 13th St. Brooklyn 11, N. Y.

Please send free booklet describing your Speed-Lay Pipe System and services:

NAME.....
FIRM NAME.....
ADDRESS.....
CITY.....STATE.....

You're *Doubly Right* when you choose *Red Arch* Buckets

*Red Arch*

MEANS A BUCKET MATCHED TO THE JOB. There are three types of Red Arch buckets — each designed to meet the requirements of a different kind of digging. Medium Duty, for average dragline work; Medium Heavy Duty, for tougher conditions such as are found in the anthracite coal fields; and Heavy Duty, for the toughest jobs — where unusual weight and strength are essential.

*Red Arch*

MEANS STEADY, HIGH OUTPUT OVER THE LONG HAUL. The high arch, coupled with right tooth and biting edge design, lets the bucket fill quickly. Accurate balance smooths the carry, cuts bobbing and spilling. And the streamlined Red Arch interior dumps fast and clean. Combined, these advantages mean top yardage shift after shift.

SIZES ¾ TO 30 YD. WRITE FOR COMPLETE INFORMATION.

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

# *New* trade literature

*Title:* **Tamping Rollers**
*Subject:* Folder illustrates the complete line of Bros pneumatic-tire rollers, ranging from 7-ton model 34 to the 50-ton Roll-O-Pactor. A diagrammatic drawing describes wheel action of the Bros Wobble-Wheel design. A six-page folder of actual job performance data shows how the 35 and 50 ton Bros Roll-O-Pactors are providing compaction on dams, dikes, super highways, airports and reclamation projects.
*Where to get:* Wm. Bros Boiler & Mfg. Co., 1057 10th Ave. S. E., Minneapolis 14, Minn. (Free)


**DREDGES**

**HYDRAULIC DIPPER CLAMSHELL**

**Bolted sectional steel hulls for landlocked, inland waters**

*If you need a dredge, write us!*

**AMERICAN STEEL DREDGE CO. INC.**
FORT WAYNE 1 · INDIANA · U.S.A.

DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905


*Title:* **Diesel Engines**
*Subject:* Booklet asks and answers ten questions pertaining to diesel engine design and gives full mechanical details on the Murphy diesel line of engines.
*Where to get:* Murphy Diesel Co., 5317 W. Burnham St., Milwaukee 14, Wis. (Free)

Title: **Snow Loaders**
Subject: Bulletin describes three different models of snow removers capable of moving up to 20 yards per minute. Photographs and drawings show details of operation and complete specifications are given.
Where to get: George Haiss Mfg. Co. Inc., NYC 51. (Free)

Title: **Mobile Crane**
Subject: Illustrated folder gives general information on the Hydrocrane with attention to specific job details. Presents actual case reports of a variety of applications and pictures several attachments available.
Where to get: Bucyrus-Erie Co., South Milwaukee, Wis. (Free)

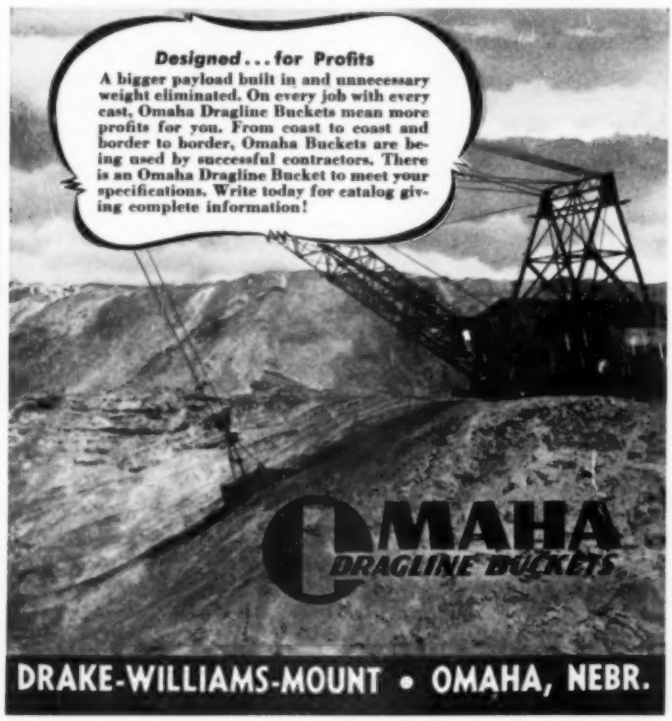
Title: **Safety Card**
Subject: Illustrated, pocket size, card gives tips on proper care and use of slings for safe handling. It is easily carried and can be referred to for any kind of wire rope slings that are safe and reliable.
Where to get: MacWhyte Co., Kenosha, Wis. (Free)

Title: **Concrete Piles and Caissons**
Subject: Bulletin gives suggested standard specifications for cast-in-place concrete piles. The "performance type" specification is prepared to include all recognized cast-in-place concrete piles. Described and illustrated are piles which have been driven to depths in excess of 100 feet; composite piles, which are combinations of thin-shell-encased concrete with lower section of wood or concrete-filled pipe; also the compressed concrete piles, which are particularly interesting today because they require no steel, making them available for immediate installation. The standard specification sheet is available separately.
Where to get: Western Foundation Corp., 2 Park Ave., NYC 16. (Free)

Title: **Single Drum Hoist**
Subject: Bulletin describes the complete line of Joy single-drum, multi-purpose hoists for mines, construction jobs, oil fields and industrial plants. Contains complete description and specifications for hoists with capacities from 500 to 3,500 pounds and driven by Turbinair, Pistonair, electric or gasoline engines. A handy chart simplifies the choice of any hoist to fill a particular need.
Where to get: Joy Manufacturing Co., Pittsburgh 22, Pa. (Free)

Title: **Welding Process**
Subject: Reprint of a 26-page article, which originally appeared in *The Welding Journal*, discusses the fundamentals of metal-arc transfer in inert-gas-shielded arc welding. Methods of overcoming porosity in aluminum welding by automatic and manual welding as well as stainless

*Continued on page 53*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A bigger payload built in and unnecessary weight eliminated. On every job with every cast, Omaha Dragline Buckets mean more profits for you. From coast to coast and border to border, Omaha Buckets are being used by successful contractors. There is an Omaha Dragline Bucket to meet your specifications. Write today for catalog giving complete information!
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# EUCLID PERFORMANCE

## Pays Off

MORE LOADS PER HOUR
MORE PROFIT PER LOAD!

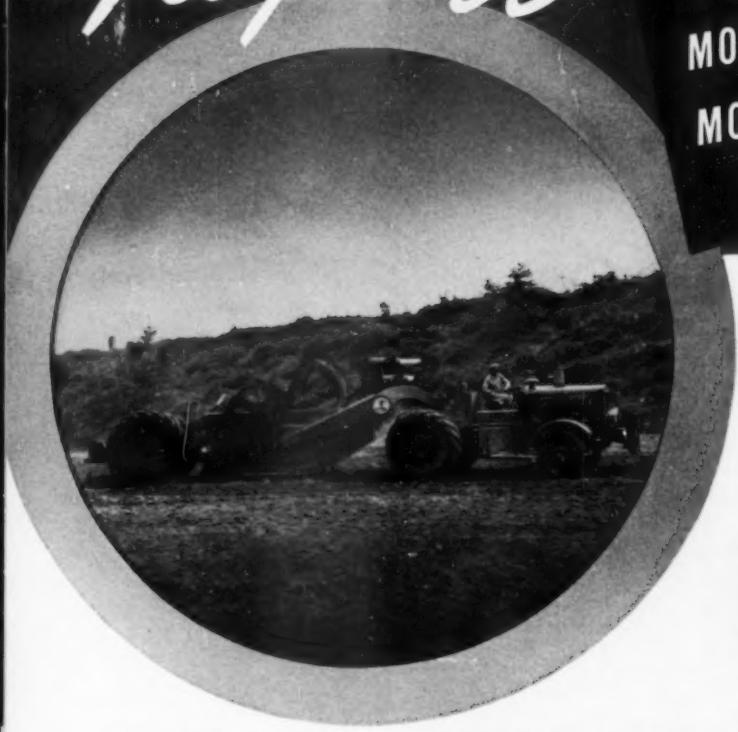
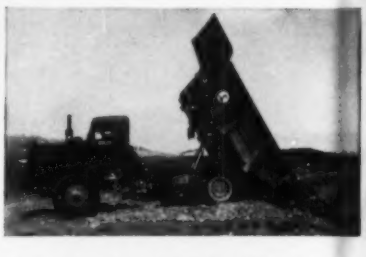


Illustration at left shows a Euclid scraper dumping approximately 20 cu. yds. of fill material at Hickory airport in North Carolina. Powered by a 275 h.p. diesel engine, this scraper has a top speed loaded of 28.2 m.p.h.



Above, a Rear-Dump "Euc" places 22 tons of earth and rock fill during construction of Chief Joseph Dam at Bridgeport, Washington. Other Euclids of this type have capacities of 10 to 34 ton payload, 125 to 400 h.p.

Carrying a heaped load of about 18 cu. yds., this Bottom-Dump hauls overburden at a big open pit bauxite operation in Arkansas. Bottom-Dump "Eucs" are powered by engines of 190 to 300 h.p., have capacities of 13 to 50 cu. yds.

Engineered specifically for heavy off-the-highway hauling, Euclids are standard equipment on many construction and industrial jobs, quarry and open pit mining operations. Combining large capacity and high speed, "Eucs" haul more loads at less cost per load.

Continuous performance records on hundreds of the toughest jobs are evidence of the dependability and long life built into every Euclid. With payload capacities ranging from 10 to 34 tons or 6.6 to 50 cu. yds., there is a Euclid model for every type of job and material. Backed by a competent world wide distributor organization, Euclid equipment pays off in lower hauling costs.

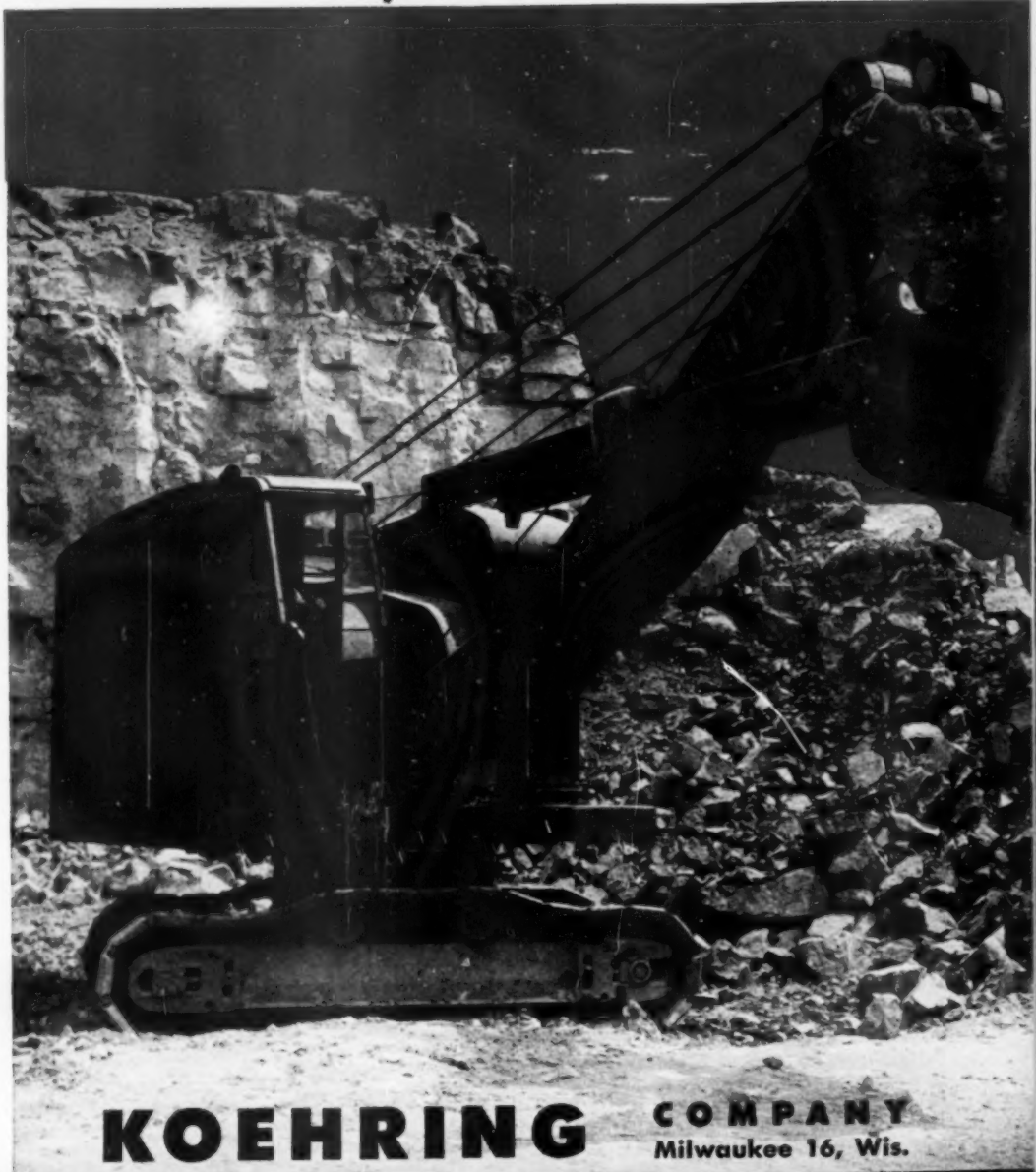
Your Euclid Distributor will be glad to discuss the advantages of using Euclids for your off-the-highway hauling jobs. Call or write for information or a hauling cost estimate.

**The EUCLID ROAD MACHINERY Co. CLEVELAND 17, OHIO**

CABLE ADDRESS: YUKLID — CODE: BENTLEY

EUCLIDS move the earth

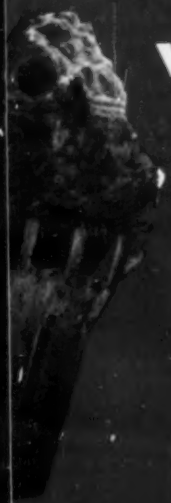
*When you compare*



**KOEHRING** COMPANY
Milwaukee 16, Wis.

*Subsidiaries:* JOHNSON • KWIK-MIX • PARSONS

. . . measure by



"KOEHRING WORK CAPACITY"

**Ask your Koehring Distributor for specific information**

KOEHRING HEAVY DUTY

7¾ to 79½ TONS lift capacity . . . ⅛ to 2½ yards dipper capacity

## Super Inch

Continued from page 21

coated with asphalt, fabric felt, asphalt and "kraft" paper. The thickness of the coating exceeds one-quarter inch. Certain sections, as deemed necessary, were wrapped with special fibreglas.

### Lowering Heavy Pipe Difficult

After coating, the section was lowered into the ditch, and joined to the previous section. Backfilling of the ditch with dozers and cleanup operations followed the lowering of the pipe. Because of the stiffness and weight of the 34-in. pipe, lowering into the ditch

• Above: Caterpillar D8 with Trackson sideboom eases pipe into trench. Most of the desert was crossed in a direct line with few complicating factors to interrupt the 9,000-ft. per day schedule.

• Right: Fleet of International TD-24 tractors mounting Superior-Cardwell pipebooms lowers the 34-in. pipe into the ditch. Because of stiffness and weight of the pipe, five to eight sideboom tractors with 30-in. rubber belt slings were used to lower in without damage to coating or joints.

• Backfilling is being done in this desolate scene by a Caterpillar D8 bulldozer.

became one of the major operations of the pipeline work. Depending upon the terrain, from five to eight large and widened sideboom tractors were required to lower the pipe in snakelike fashion, without damage to the coating or to the pipe. During the operations, the line was handled with 30-in. wide rubber belt slings to avoid possibility of damage.

A radio-telephone system expedited instructions between the trailer offices and the men in the field. Jeeps and pickup trucks in the field had mobile transceivers, thus facilitating the work at hand. A mobile camp of three office trailers composed the field office.

The project was a joint venture sponsored by Bechtel Corp. with H. C. Price and Conyes Construction Corp. R. L. Bowman was general superintendent, S. J. Valline, office manager and consultant was Ray Hamilton.

On August 15, 1950, announcement was made of the completion of the El Paso Natural Gas Company's section of the pipeline from the Texas oil fields. First gas has been turned into the P.G. and E. Super Inch for purging and 150 million cu. ft. per day delivery is scheduled for this month.


EASY TO ASSEMBLE

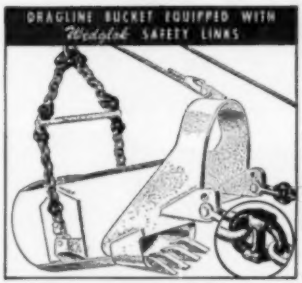
Wedglok

PATENTED

CONNECTING LINKS

SAFETY • STRENGTH

• SIMPLICITY • ENDURANCE




An improved connecting link that combines safety and simplicity. Its strength exceeds the published strength of comparable alloy chain.

WEDGLOK links can be assembled rapidly on the job—no special equipment required; particularly useful for dragline buckets, slings and other equipment with chain or wire rope attached.

Regular and pear shape. Sizes ⅜" to 3"

**Available at your local distributors**

*Mail the coupon for price list and complete information*

**Please send WEDGLOK data.**

Name_____

Firm_____

Address_____

City_____ State_____

A PRODUCT OF

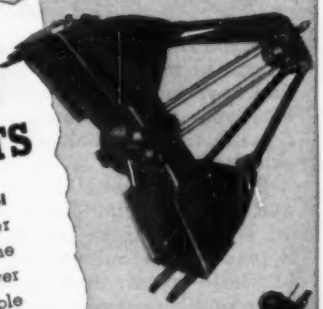
INTERSTATE DROP FORGE CO.

4077 N. 27th ST. MILWAUKEE 9, WIS.

You Can't Beat Welded Construction

WELLMAN

Williams Type BUCKETS



• Wellman pioneered **welded rolled steel construction** for longer life and greater service. It's the extra strength that gives the extra, low-cost digging power. Whatever your requirements . . . whether for Multiple Rope, Power Arm, Dragline, Power Wheel or Special Service—specify Wellman! ⅜ to 16½ yd. capacity.

SEND FOR BULLETIN

THE WELLMAN ENGINEERING COMPANY

7002 CENTRAL AVENUE • CLEVELAND 4, OHIO

~~FORFEIT~~ ~~PENALTY~~

# You can always finish "On Time" when you Power with NEW BUDA DYNA-SWIRL DIESELS

TRACTORS
MOTOR GRADERS
SCRAPERS
DOZERS
DRAGLINES
CRANES
SHOVELS
COMPRESSORS
DRILLS
PUMPS
CONVEYORS
POWER PLANTS
TRENCHERS
ETC.

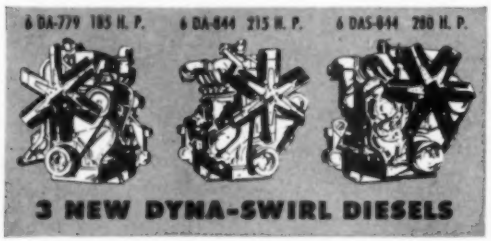
there's a BUDA DIESEL for every piece of equipment

***INSTALL OR SPECIFY BUDA DYNA-SWIRL DIESELS AND GUARANTEE YOUR PROFITS!***

Watch a BUDA Diesel-powered dozer, tractor, scraper, wagon or motor grader work—see it dig in, hang on and keep moving fast with really BIG loads—and see why operators who have switched to the new BUDA Dyna-Swirl Diesels always count on finishing ahead of schedule.

Buda Dyna-Swirl Diesels will give you more trips and handle bigger loads with greater fuel and lube oil economy PLUS less maintenance and downtime. Replace worn out engines with these amazing new engines—specify them in new equipment and increase your profits on every unit.

- MORE HORSEPOWER
- LOWER FUEL CONSUMPTION
- GREATER LUGGING ABILITY
- MORE PRODUCTION TIME
- GREATER OPERATOR COMFORT
- SAFER




Ask your nearby Buda Distributor for the full story on Buda Dyna-Swirl Diesels. You can't afford *not* to know about them! Write for complete details, circulars and specifications. The Buda Company, Harvey, Illinois.

BC-6

BUDA

# NOT in the *Contract*

Mr. Biggs liked to know all about the employees who toiled in his vast business. One day he came upon a new young man who was dexterously counting out a large wad of the firm's cash.

"Where did you get your financial training, young man?" he asked.

"Yale," the young man answered.

Mr. Biggs was a staunch advocate of higher learning.

"Good," he said, "and what's your name?"

"Yackson," was the reply.

A customs officer, while examining a sailor's baggage, discovered a bottle of whiskey. "I thought you told me there were only night clothes in that suitcase?"

"Right," replied the gob, "that's my night cap."

"Two hundred dollars for an electric refrigerator? That's too much," said the prospective buyer and walked out of the store.

The next morning he ordered a refrigerator over the phone, and requested immediate delivery.

"Might I ask what made you change your mind?" asked the salesman.

"Certainly," replied the man. "When I came home yesterday my wife was leaning over our old icebox and I gave her a playful pat. Without looking up, she said, 'Fifteen pounds today, darling.' "

The prizefighter wasn't having spectacular luck in fending off his opponent's attack. In fact, he looked pretty sick of the whole affair.

"Stop those punches!" shouted his excited manager from the corner.

The fighter managed to move his battered lips enough to retort: "You don't see any of 'em gettin' past me, do you?"

Convict: "How long you in for?"

New Cellmate: "Ninety-nine years. How long you in for?"

Convict: "Seventy-five."

New Cellmate: "Then you take the bed nearest the door; you're getting out first."

A woman stepped off the penny scales and turned to her husband. He eyed her appraisingly and asked: "Well what's the verdict? A little overweight, eh?"

"Oh, no," replied the little woman, "but according to that height table printed on the front, I should be about six inches taller."

They are planning a television show about a one-legged old maid to be called "Hopalong Chastity."

Trusty: "I'll do anything I can, warden."

Warden: "Well, don't put yourself out."

Husband: "I've been thinking it over, dear, and I've decided to agree with you."

Wife: "It won't do you any good. I've changed my mind."

"Why is your rooting section so good?"

"We give them a cheering drink before every game."

"A cheering drink?"

"Yes, root beer!"

Girl Friend — "Well, darling, if I didn't wear all these nice clothes, would you still think I'm beautiful?"

Boy Friend — "Let's decide that question right now."

"Captain, is this a good ship?"

"Why, madam, this is her maiden voyage!"

He (making the time-worn excuse): "I'm afraid we'll have to stop the car for a while. The engine is overheating."

She: "You guys are such liars. You always say the engine."

"Clarice is certainly wearing a daring gown, isn't she?"

"Yes, it's daring every man in the room."

"My wife spends too much money, nags me constantly, is very untidy and doesn't understand me."

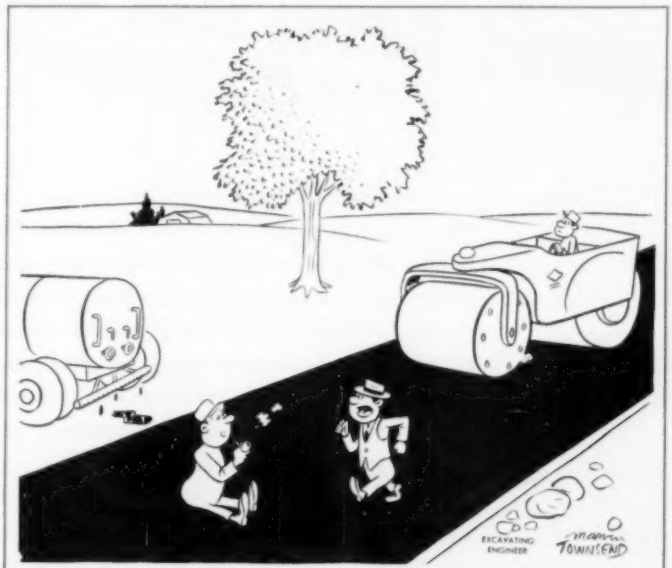
"Really? When did you meet this other woman?"

He: "I reckon I'm just a pebble in your life."

She: "Well, you could be a little boulder."

Clerk: "My wife says I should ask you for a raise in salary."

Boss: "All right, I'll ask my wife if I can give it to you."




"Come, come, Smithers. Get off your asphalt!"

# ALWAYS GOOD FOR THE FIELD GOAL

Whatever the output goal in the field, a Bucyrus-Erie excavator meets it economically, for the Bucyrus-Erie ⅜ to 36 cubic yard line of shovels and draglines offers a machine to fit any mine or quarry requirement. Every machine features famous *years ahead* design for steady high output with low upkeep and maintenance costs . . . for smooth reliable performance on challenging jobs . . . for years of dependable service that mean consistently profitable operation. Get the full details from those who know — owners and operators themselves — and learn how Bucyrus-Eries can set new production records on your job.

1211-900

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

## New Trade Literature

Continued from page 44

steel, heat-resisting alloys, clad materials and aluminum bronze are covered. Half of the paper is devoted to specific applications. The article is illustrated with 68 photographs and charts. The text is further supplemented with 14 tables of tests and specification data.

Where to get: Air Reduction, 60 East 42nd St., NYC 17. (Free)

Title: **Soil Compactor**

Subject: Bulletin describes the compaction of soil by vibratory pneumatic-tired rollers as one of the newest and most successful methods developed in recent years. Brochure also gives a detailed description of the action of the Cedarapids Compactor, illustrated with drawings which show exactly what happens to the soil under compaction.

Where to get: Iowa Manufacturing Co., Cedar Rapids, Iowa. (Free)

Title: **Hoist Bulletin**

Subject: Bulletin covers new P&H electric hoists with installation pictures, descriptions and specifications of all models. A large cutaway drawing reproduced on the two center pages clearly shows construction features of the hoists.

Where to get: Harnischfeger Corp., Milwaukee 14, Wis. (Free)

Title: **Service Reporter**

Subject: Booklet contains helpful hints and basic information on how to keep Caterpillar equipment in good working condition. For the present it will be issued four times a year —October, January, April and July. Each issue will contain subjects applicable to every owner — fleet or individual — and will not be confined to one class of equipment. The first issue covers service requirements of Caterpillar equipment in wintertime.

Where to get: Caterpillar Tractor Co., Peoria 8, Ill. or any Caterpillar Dealer. (Free)

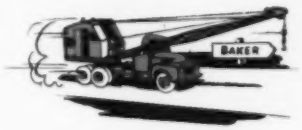
Title: **Hardfacing Catalog**

Subject: Catalog is devoted exclusively to cutting down on wear by use of hardfacing and manganese steel welding rods, electrodes and weldments. This booklet shows the complete line of AMSCO products and tells what they are, how they're used, what they will do and when and where to use them.

Where to get: American Manganese Steel Div., American Brake Shoe Co., Chicago Heights, Ill. (Free)


380 miles of pipe handled by 1 BANTAM† at scattered locations

54 carloads unloaded and loaded into trucks in 8 days at one site




Here's "big-job proof" of Bantam speed and economy! On 380-mile natural gas line project from Worland, Wyoming to Baker, Montana, DUNN BROS. of Dallas, Texas is handling *all pipe unloading and re-loading with one 5-ton capacity truck-mounted Bantam crane.* Equipped with 35' boom and power-controlled lowering, Dunn's fast-swinging Bantam quickly handles 50' sections of 12¾" dia. pipe (1600 lbs. each) . . . *unloads 36 to 42 pipes from railroad car in 8 to 10 minutes . . . re-loads 18 sections per truck in 8 minutes.* When last section is loaded at one spot, 35 MPH Bantam high-balls over highway to next unloading site, *thus eliminating need for extra men and machines.* YOU, TOO, can cut costs with Bantams! Write for details.

Clip... Mail today!

SCHIELD BANTAM CO., 202 Park St., Waverly, Iowa SB-P-1

Send details on truck-mounted Bantam ☐ Shovel ($5900)* ☐ Hoe ($5730)* ☐ Pile Driver ($5818)* ☐ Crane ($5265)* ☐ Dragline ($5665)* ☐ Clamshell ($5790)*

Title _____

Name _____

Company _____

Address _____

City _____ State _____

†Reg. U.S. Pat. Off.

*Less truck. F.O.B. Waverly, Iowa.

Prices subject to change without notice.

SCHIELD BANTAM

Costs less . . . travels 35 m. p. h.

GETS MORE JOBS DONE

# NOW TWO MORE *Completely New*

## HD-9

WEIGHT: 18,500 lb.
70 DRAWBAR Hp.
GM 4-71 DIESEL ENGINE
SPEEDS: 6 forward, to 5.68 mph.;
3 reverse, to 4.43

*OUT AHEAD* **Modern Allis-Chalmers Line sets New Tractor Standards**

Each of these four Allis-Chalmers crawlers gives you a new yardstick for rating tractors. Each brings you a new kind of performance . . . plus new strength, operator comfort and service simplicity. For the finest in crawler tractors, see your Allis-Chalmers dealer.

# ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

*The World's Most Modern Line of Crawler Tractors*

# Allis-Chalmers Tractors

## NEW POWER RATING

POWER, WEIGHT, BALANCE put them in a class of their own — never such traction . . . such pulling, pushing or lifting ability. And the smooth-operating GM 2-Cycle Diesel engines work without strain under the most extreme conditions.

## NEW STRENGTH

All parts are designed and built to carry their loads with a margin of safety. No need to go to a larger tractor just for strength alone. The HD-9 and HD-15 set new standards for tractor quality.

- ✓ For Greater Production
- ✓ For Easier Operation
- ✓ For Simplified Servicing

## NEW DESIGN SIMPLICITY . . .

**for Easier Control and Greater Operator Comfort**— Easy-shift transmission • Self-energizing brakes • Booster steering controls • Adjustable, cushioned seat • Wide arm rests • Convenient controls and pedals • Full visibility • Instant electric starting.

**for Simplified Servicing** — Unit construction permits removing major assemblies without disturbing companion groups • Extended lubrication periods throughout — 1,000 hours on truck wheels, idlers and support rollers.

**Complete Line of Matched Equipment, Developed in Cooperation With Allied Manufacturers, Available For Both The HD-9 and HD-15.**

# HD-15

**WEIGHT: 27,500 lb.**
**102 DRAWBAR Hp.**
**GM 6-71 DIESEL ENGINE**
**SPEEDS:** 6 forward, to 5.80 mph.; 3 reverse, to 4.51

**TO ADVERTISE:** All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date — 15th of preceding month. Example: January closes December 15th.

**TO INQUIRE:** Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisement themselves.

No. 15-62 model 7200, Marion walking dragline, 135' boom, 24' diameter base, powered by Fairbanks-Morse, model 35, six-cylinder diesel engine driving the hoist and drag machinery. Cummins HIS 600, six-cylinder diesel engine driving the generator for furnishing current to the independent swing machinery. Location Wyoming. Box 3430

1—Model 18½-yd. Northwest crane dragline. Condition guaranteed same as new.

1—¾-yd. Byers combination shovel, pull shovel and crane in guaranteed good mechanical condition. Can be inspected our yard. Photographs furnished.

**Hunter Tractor & Machinery Co.**
**327 South 16th Street**
**Milwaukee 3, Wisconsin**
**ORchard 2-6580**

New Bucyrus-Erie 37-B shovel front end complete.

**N. Fornaby**
**Route No. 4 Ft. Lee, New Jersey**

Bucyrus-Erie 22-B. 1947 model. ¾-yd. shovel-dragline. 40' boom. I.H.C. diesel. Completely overhauled. A-1 condition. Spare parts. $15,000. John Konsler, R.R. No. 2, Henderson, Kentucky. Phone 5543.

Northwest model 25; 6; 80D; 95. Manitowoc 3500; 4500 new — will rent. Bucyrus 54-B; Monighan 5W; 7W; 9W; 450.

**A. W. Nevers Phone 32 Mt. Pleasant, Iowa**

DREDGING EQUIPMENT

1—SIX INCH DIESEL-POWERED, PORTABLE, HYDRAULIC PIPE LINE DREDGE complete with cutter ladder for digging to 15 feet, 6-inch dredging pump, 5 drum cross-deck type winch, service pump, piping, spuds and frames. Good condition. Location Central Indiana.

**Stockberger-Seastrom, Inc.**
**1409 Madison Avenue Indianapolis 25, Ind.**
**Phone MArket 7401**

New type Caterpillar D-6. Used 1000 hours. 20" tracks. Good shape.

**Robert Montcalm**
**309 Chestnut Street Munising, Michigan**

50% Discount
Genuine Hendrix Unused Dragline
Parts for Bucket Sizes
⅜ yd. to 2½ yd.
LIPS—TEETH—CHAINS
PINS—ETC.
Write for Complete List

**Quick Service Co.**
**1226 West Adams Street**
**Chicago, Illinois**

15-B

Shovel, booms, handles, dippers, spare teeth, "Red Arch" buckets. Send for parts list at 50% off list.

Osgood 206 Type 29 ½-c. yd. shovel attachments, booms, handles and dippers. Satisfaction guaranteed.

**Central Contractors Service, Inc.**
**George A. Carlson, President**
**1150 N. N. North Branch Street**
**Chicago 22, Illinois**
**Telephone Michigan 2-1515**

1—2½-yd. shovel attachment less deck machinery for Bucyrus-Erie 54B. $4,000.

1—Northwest 40 ft. crane boom for Model 105. $400.

3—Koehring 35 ft. crane beams for Model 304. $350 each.

**The Lorenz Equipment Company**
**547 West Rich Street Columbus 8, Ohio**

90'-0" boom dragline equipment for 100-B shovel, western location. Box 3425

1—Bucyrus-Erie 10-B shovel front attachment —used.

1—Bucyrus-Erie 22-B heavy-duty rock dipper shovel front—new.

**The Bode-Finn Company**
**2650 Spring Grove Ave.**
**Cincinnati, Ohio**
**MUlberry 2200**

**New, Surplus Engines At Bargain Prices**

2—Hercules Model JXB gasoline engines, 6 cyl. 3⅝" x 4¼", rated 65 H.P. at 1600 R.P.M.

**Bucyrus-Erie Company**
**Parts Division**
**South Milwaukee, Wisconsin**

Used 4 cu. yd. coal loading dipper in A-1 condition, designed for use on Bucyrus-Erie model 54-B shovel. Located in western Pennsylvania and available immediately. Priced reasonable. Box 3426

Two 7-yard dragline buckets.
Two 10-ton drop bottom trailers.

**Atlas Coal Company**
**Oskaloosa, Iowa**

**New Dragline Buckets**

1—1¼ cubic yard Red Arch Type AX medium duty buckets.

2½ cubic yard Type AX dragline bucket. (Reconditioned.)

3 cubic yard Red Arch, Type AY heavy duty bucket.

**Bucyrus-Erie Company**
**Parts Division**
**South Milwaukee, Wisconsin**

Wanted: One 2 to 3 yd. electric crawler crane or clamshell. Advise age, mfr., approx. location and price. Box 3427

## HELP WANTED

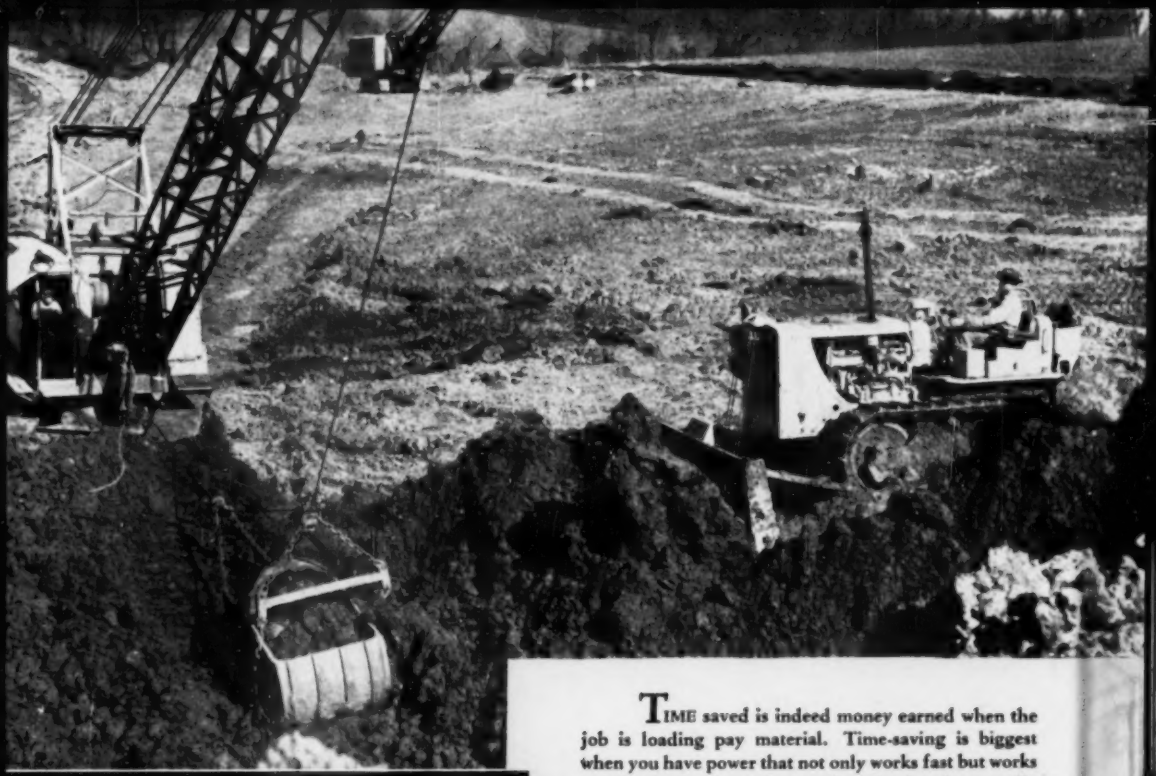
EXPORT SERVICE ENGINEER required by manufacturer of tractor equipment. Should be well advised on crawler tractors and allied equipment. Must be willing to travel abroad. Box 3428

## POSITIONS WANTED

Gen. supt. or supt. available. Experience covers 25 year supervising, estimating and building all classes of excavating; railroads; highways; airports; earth-fill dams; large sewers. Honest, sober, reliable. Best of references. Box 3429

Construction or quarry superintendent, 42 years old, married, no children, do not drink. Eight years officer in aviation engineers and instructor in heavy equipment. Ten years owned small business, grading, quarrying and macadam. Foreign service preferred. Wife registered nurse. Both available December 1st. Box 3424

**If you are Buying or Selling Used Equipment this is the place to let the Excavating Industry know about it.**



# Team for fast loading

## LOOK UNDER THE HIDE

Connecting rods for "Caterpillar" Diesels are made of medium carbon steel, drop forged and heat treated. Of "H" section design, they are rifle drilled to provide oil passage to the piston pin, and to oil-cool the piston. Connecting rods are balanced to close limits. Crankpin bearings are solid aluminum alloy, precision type. Piston-pin bushings are bronze and are precision bored. Look under the hide for built-in quality.

TIME saved is indeed money earned when the job is loading pay material. Time-saving is biggest when you have power that not only works fast but works steadily . . . for down-time, on the other hand, can easily turn savings into losses. The loss doubles when the job requires a team of interdependent machines — for when one goes down the other becomes inactive too.

The Federal Chemical Company (Tennessee) minimizes such happenings by using dependable power: "Caterpillar" Diesel. For loading phosphate rock from a 2-acre storage pile onto railroad cars (see picture), a "Caterpillar" D7 Tractor 'dozes the material to a dragline powered with a "Cat" D13000 Engine. An average of 112 ton-yards keeps piling into 50-ton railroad hopper cars per hour. Outstanding operating advantages, according to Federal's Tom S. Miller, are speed and very little down-time. "'Caterpillar'-powered equipment," he adds, "fills the bill best for us under the trying conditions of phosphate mining."

Leading manufacturers of all types of mining and excavating equipment have engineered their machines to be powered by "Caterpillar" Diesels. You can standardize on power by specifying "Caterpillar" Engines on your machinery purchase order.

Today the importance of "Caterpillar" products, both for military use and for maintaining the national economy, is greatly increased. Talk over your machinery requirements with your "Caterpillar" dealer. He has ample parts stocks to keep your present equipment doing its job and will do his utmost to make prompt delivery of new machines.

**CATERPILLAR, PEORIA, ILLINOIS**

**CATERPILLAR**

DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

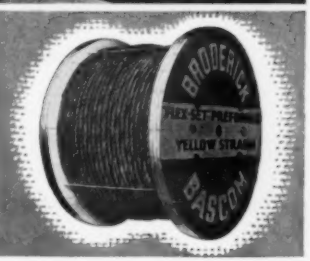
Dig and dump . . . speed the cycle . . . take those shocks . . . *stay on the job*—that's the big order you give a hoist rope. To have it filled, put *Preformed* Yellow Strand Hoist Rope on your power shovel. Specify Lang Lay with Independent Wire Rope Core—6 x 19 for ropes up to and including 1″ in diameter, 6 x 41 for sizes 1⅛″ and larger.

In *Preformed* Yellow Strand, whatever the construction, internal stresses have been relaxed. You gain with longer rope life, fewer shutdowns for replacement, more production for your rope dollar. Call your B & B distributor now so you'll have a real *working* rope on hand when it's time to change your hoist, drag, scraper or other heavy-duty line.

**Broderick & Bascom Rope Co., St. Louis 15, Mo.**

*Branches:* New York, Chicago, Houston, Los Angeles, San Francisco, Portland, Seattle *Factories:* St. Louis, Peoria, Houston, Seattle

**BRODERICK & BASCOM**

***Yellow Strand***

**PREFORMED WIRE ROPE**